



SCHOOL OF HEALTH SCIENCES

(DIVISION OF DENTISTRY)

**Assessment of the educational needs and services available in cleft
lip/palate and craniofacial anomalies management in South Africa**

A research thesis submitted in fulfillment of the requirements

for the degree of Doctor of Philosophy (PhD)

in the School of Health Sciences, University of KwaZulu-Natal

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Date of submission: March 2020

DECLARATION

I, EAM Ghabrial, declare that:

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Any contribution to publications that form part of and include research presented in this thesis is stated, including publications submitted.

Signed 
.....

DR EAM GHABRIAL

31 MARCH 2020

DEDICATION

This thesis is dedicated to my wife and daughter, Caroline and Sarah Ghabrial, my father, Prof AM Ghabrial and my mother Raufa Tawfik and all patients with cleft lip/palate and craniofacial anomalies.

ACKNOWLEDGEMENTS

I want to acknowledge my sincere appreciation and gratitude to the following people and institutions for their kind assistance in this research project:

- My supervisor, Professor K-W Bütow, for his excellent mentoring, supervision, guidance and support throughout this research study and the opportunity to be involved with the cleft lip/palate and craniofacial deformities clinic.
- Professor FA de Wet (Professor Emeritus and previous Deputy Chairperson of the School of Dentistry) for proof reading the thesis and the publication manuscripts.
- The Gerald Gavron Research Fund of the South African Society of Orthodontics for financial support.
- The University of Pretoria for providing the Qualtrics software platform used to set up the questionnaire, collect the data and provide the descriptive analysis.
- All the research participants for their cooperation and willingness to participate in this study.
- Dr Olorunju (statistician) and the Biostatistics Unit of the South African Medical Research Council for providing statistical support.
- My wife, Caroline, for her assistance with the illustrative figures, support and encouragement in completing this research study.
- My loving daughter, Sarah, for the sacrifice of many hours of family time, so that I could complete this research.
- My brother, Sami, for his expertise and help in designing and structuring the study and the questionnaire and pushing me all the way to complete the thesis.
- Metropolitan A Markos continuous reminder verse, Philippians 1:6 "being confident of this very thing, that he who has begun a good work in you will completed..."
- Prof. AGH McCollum for his encouragement along the journey of the study
- Mrs Christa Swart, and Mr. Billy Raaths for type settings of the thesis.
- Mrs Michelle Loggenberg, for language editing.

TABLE OF CONTENTS

CHAPTER 1

1.1	INTRODUCTION.....	1
1.2	THE RATIONALE FOR THE STUDY.....	2
1.3	PROBLEM STATEMENT	2
1.4	SIGNIFICANCE OF THE STUDY	2
1.4.1	Objectives of the study	3
1.4.2	Research questions	3
1.4.3	Concept clarification	3
1.4.4	Assumptions of the study	4
1.4.5	Delineation of the study	4
1.4.6	Presentation of material.....	4
1.4.7	Summary	4

CHAPTER 2

2.1	LITERATURE REVIEW	6
2.1.1	Introduction	6
2.2	KEY CONCEPTS	7
2.2.1	Introduction	7
2.3	SUMMARY	9

CHAPTER 3

3.1	RESEARCH DESIGN AND METHODOLOGY	10
3.1.1	Research design.....	10
3.1.2	Methodology	10
3.1.2.1	Context	10
3.1.2.2	Questionnaire design	10
3.1.2.3	Selection of participants	11
3.1.2.4	Procedure.....	12
3.1.2.5	Data collection.....	12
3.1.2.6	Data analysis.....	12
3.1.2.7	Data interpretation.....	13
3.2	ETHICAL CONSIDERATIONS	13
3.2.1	Gatekeeper permission	13

3.2.2	Confidentiality.....	13
3.2.3	Dissemination of results	14
3.2.4	Summary & Limitations	14

CHAPTER 4

4.1	RESULTS: MANUSCRIPT/PUBLICATION	15
4.1.1	MANUSCRIPT 1: Academic education of South African maxillofacial and oral surgeons	15
4.1.1.1	Introduction	15
4.1.1.2	Academic education of South African maxillofacial and oral surgeons in the field of cleft lip/palate and craniofacial deformities	15
4.1.1.3	References	22
4.1.1.4	Figures and tables	24
4.1.2	MANUSCRIPT 2: South African speech-language therapists’ opinion of their training.....	29
4.1.2.1	Introduction	29
4.1.2.2	South African speech-language therapists’ opinion of their training in cleft lip and palate and craniofacial deformities.....	29
4.1.2.3	References	36
4.1.2.4	Figures and tables	38
4.1.3	MANUSCRIPT 3: Perceptions of South African plastic surgeons regarding academic education	40
4.1.3.1	Introduction	40
4.1.3.2	Perceptions of South African plastic surgeons regarding academic education in the field of facial cleft and craniofacial anomalies	40
4.1.3.3	References	46
4.1.3.4	Figures and tables	49
4.1.4	MANUSCRIPT 4: The orthodontist’s views regarding academic education	53
4.1.4.1	Introduction	53
4.1.4.2	The orthodontist’s views regarding academic education in cleft lip and palate as well as craniofacial deformities in South Africa.....	53
4.1.4.3	References	59
4.1.4.4	Figures and tables	62

CHAPTER 5

5.1	SYNTHESIS AND RECOMMENDATIONS	65
5.1.1	Synthesis.....	65
5.1.1.1	Introduction	65
5.1.1.2	Education.....	65
5.1.1.3	Lesson(s) from the current education of all surgeons.....	66
5.1.1.4	Comprehensive Online Education Services (COES) for orthodontists and speech-language therapists	66
5.1.1.5	The study recommendations.....	68

CHAPTER 6

6.1	REFERENCES.....	72
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CHAPTER 7

7.1	APPENDICES.....	78
7.1.1	Appendix 1: Ethics approval (HSS/0235/617D)	78
7.1.2	Appendix 2: Research instrument (questionnaire)	79
7.1.3	Appendix 3: Electronic informed consent.....	92
7.1.4	Appendix 4: Email survey link to health professionals.....	94
7.1.5	Appendix 5: Telephone call and interview script.....	95
7.1.6	Appendix 6: Example of gatekeeper permission.....	96
7.1.7	Appendix 7: Medpages gatekeeper permission.....	97
7.1.8	Appendix 8: GGRF funds award.....	98
7.1.9	Appendix 9: Editing certificate	99
7.1.10	Appendix 10: Originality certificate.....	100
7.1.11	Appendix 11: Oral presentation at ICPF 2018	101
7.1.12	Appendix 12: Abstract 016 ICPF 2018	102
7.1.13	Appendix 13: Acceptance of IADR abstract	103
7.1.14	Appendix 14: Poster presentation SA-IADR2018/48 th	104

LIST OF FIGURES

FIGURE 1: Kern's (2009) six steps to curriculum development.....	8
FIGURE 2: Dreyfus model of skill acquisition.....	9
FIGURE 3: Questionnaire survey flow structure	11

MANUSCRIPT 1

FIGURE 1: Respondent distribution according to province	24
FIGURE 2: Respondent distribution according to clinical experience	25
FIGURE 3: Did your postgraduate programme include any of the following in the management of CLP/CFD?	25
FIGURE 4: Reasons preventing MFOS from adequately treating CLP/CFD patients.....	26
FIGURE 5: Admission requirements for the degree(s) and clinical fellowship courses	26
FIGURE 6: Candidates' reasons for enrolling in a CLP/CFD postgraduate course	27
FIGURE 7: Forms of evaluation for degree(s) and clinical fellowship courses	28

MANUSCRIPT 2

FIGURE 1: Respondent distribution according to province	38
FIGURE 2: Respondent distribution according to clinical experience	38
FIGURE 3: Undergraduate and postgraduate academic education in CLP/CFD patient management.....	39
FIGURE 4: What prevents SLT from treating CLP/CFD patients?	39

MANUSCRIPT 3

FIGURE 1: Respondent distribution according to province	49
FIGURE 2: Respondent distribution according to age.....	49
FIGURE 3: Did your postgraduate programme include any of the following in the management of FC/CA?	50
FIGURE 4: Reasons preventing PS from adequately treating FC/CA patients	50
FIGURE 5: Admission requirements	51
FIGURE 6: Motivation for enrolling in an FC/CA postgraduate course	52
FIGURE 7: Forms of evaluation for degree(s) and non-degree fellowship courses	52

MANUSCRIPT 4

FIGURE 1: Respondent distribution according to provinces.....	62
FIGURE 2: Respondent distribution according to clinical experience	63
FIGURE 3: Did your postgraduate programme in CLP/CFD include the following learning opportunities?	63
FIGURE 4: How confident are you in treating and managing CLP/CFD patients?	64
FIGURE 5: Forms of evaluation for degree(s) and non-degree fellowship courses	64

LIST OF TABLES

MANUSCRIPT 1 - TABLE 1: Type of course recommended (percentages)	26
MANUSCRIPT 1 - TABLE 2: The goals and objectives of postgraduate training programmes (percentages)	27
MANUSCRIPT 3 - TABLE 1: Types of course recommended	51
MANUSCRIPT 3 - TABLE 2: Recommended learning activities	51
MANUSCRIPT 4 - TABLE 1: Type of course recommended (percentages)	64
TABLE 1: Summary of the PhD study recommendations	71

LIST OF ABBREVIATIONS

ACPA	American Cleft Palate Association
ASDAJ	South African Dental Association Journal
CFA	Craniofacial anomalies
CFD	Facial cleft deformity
CLP	Cleft lip and palate
COES	Comprehensive Online Education Services
CPD	Continuing professional education
ENT	Ear nose and throat specialist
EPAs	Entrustable professional activities
FC	Facial cleft
GGRF	Gerald Gavron reserve fund
HCP	Health care professionals
HPCSA	Health Professions Council of South Africa
HSSREC	Humanities and Social Sciences Research Ethics Committee
IADR	International Association for Dental Research
ICPF	International Cleft Palate Foundation
IPE	Interprofessional education
KZN	KwaZulu-Natal
MFOS	Maxillofacial and oral surgeons
MOU	Memorandum of understanding
MPhil	Master of Philosophy
NGO	Non-governmental organisation
NPO	Non-profit organisation
Orthod	Orthodontists
PGDip	Postgraduate diploma
PS	Plastic surgeons
SACLPA	South African Cleft Lip/Palate Association
SAJCD	South African Journal for Communication Disorder
SASLHA	South African Speech-Language-Hearing Association
SLT	Speech-language therapists
UKZN	University of KwaZulu-Natal
UP	University of Pretoria
WHO	World Health Organization

DEFINITION OF TERMS

Interprofessional education: students from two or more different health professions learn with, from, and about each other to improve collaboration and quality of care (Dyer 2003).

Interdisciplinary team: Team of health-care practitioners who synthesise and harmonise the links between disciplines to create a coordinated and coherent health delivery system (Dyer 2003).

Collaboration: An active engagement between people from diverse backgrounds working together to provide services or solve problems (Dyer 2003). It involves the process of communication, sharing of knowledge and skills of different health professionals, and joint decision making in the provision of care (Dyer 2003).

Multidisciplinary team: Health professionals representing different health and social care professions, working closely with one another, but may not necessarily interact, collaborate, or communicate with each other (Dyer 2003).

Pedagogy: An academic discipline of how knowledge and skills are imparted in an educational context, and it considers the interactions that take place during learning.

ABSTRACT

Background

Since the 1960s, South Africa has been providing multidisciplinary treatment for children with cleft lip and/or palate (CLP) and craniofacial anomalies (CFA) (Marks, 1960). Currently, the standard for best practice (ACPA, 2017) regarding cleft lip/palate and craniofacial anomalies focuses on oral function, improved appearance, and normal speech. Therefore, American cleft palate association recognize the core of the cleft palate team comprises maxillofacial and oral surgeons (MFOS), orthodontists (Orthod), plastic surgeons (PS), and speech-language therapists (SLT).

Cleft lip/palate and craniofacial anomalies vary in severity and facial growth patterns, and treatment is complex and lengthy. Therefore, it requires collaboration among different disciplines, with the aim of reaching the treatment goals of good facial growth, aesthetically acceptable appearance, and dental occlusion. Consequently, it becomes increasingly important to provide adequate training for these professionals, to empower them not only to provide efficient treatment, but also to assume leadership roles in this field. This is the first study ever to include all four disciplines.

Objectives

To obtain information regarding the CLP/CFA academic education of MFOS, Orthod, PS and SLT; the services that those practitioners offer to CLP/CFA patients; and the educational and training needs in this field.

Methods

A 51-item online survey questionnaire was used to collect quantitative data of a randomised sample of professionals from the four disciplines: MFOS, Orthod, PS and SLT. The study was introduced to the participants by means of a telephone call and they were given the option to record their responses or to send the online questionnaire by email. For the orthodontists, the data was collected during their annual scientific congress by two students using an iPad.

Results

The questionnaire was completed by 46,3% of MFOS, 41% of Orthod, 46,5% of PS and 18,83% of SLT who are registered on the Medpages database. Although 42,6% of the participating MFOS, 92% of Orthod, 41,6% of PS, and 42,7% of SLT indicated that they provide treatment and intervention for CLP/CFA patients, only a few felt confident to provide such services. The study

shows that professionals are treating patients beyond their competence, which could result in poor outcomes and services. Most of the respondents agreed that there is a need to improve CLP/CFA education, and the majority recommended fellowship, sub-speciality training and/or certified courses. The minority suggested continuing-education workshops.

Conclusion

Most of the professionals who participated in this study provide treatment for both CLP and CFA patients, despite some of them lacking in confidence when treating such cases. The majority agreed that there is a strong need to establish an educational strategy to meet the needs of professionals who treat CLP/CFA patients. The respondents suggested dedicated programmes in the CLP/CFA field. The professionals recommended fellowship, sub-speciality training, certified courses, and continuing-education workshops.

CHAPTER 1

1.1 INTRODUCTION

Craniofacial anomalies (CFA) is a congenital anomaly of the soft tissue envelope and its underlying musculoskeletal system within the craniofacial structure and other areas. (Bütow 1987 & Isiekwe et al., 2016). Cleft lip and palate represent the largest group of CFA with oral structures involvement (Ranalli, 1981). On average, it affects one in 700 live births, in South Africa with racial and geographical differences (Bütow et al., 2007). Craniofacial anomalies management is a public health problem with a global burden due to the unique health needs and care shortage resulting from the socio-economic status (Hook, 1988, Carmichael et al., 2003, Petersen et al., 2005 & Poenaru, 2016). Children with CLP/CFA are considered patients with special needs and display multiple complex health problems, including early feeding and nutrition difficulties, middle ear disease, deviation in speech, dentofacial abnormalities, and psychosocial adjustment problems (Rada et al., 2015). The American Academy of Paediatric Dentistry (2005) advocates that the care for special needs children must be comprehensive, organised, socially understanding, tailored to their specific requirements, and easily reachable. The fact that these patients usually have challenging health issues because of additional complexities related to their skeletal, soft tissue and facial problems, makes it more difficult for a single discipline to handle, as it cannot make all treatment decisions (Kokich, 2012). Management of these patients usually needs a sophisticated multidisciplinary approach (Bütow, 1995; Dabed & Cauvi, 1998; Berkowitz, 2010a; Bütow & Zwahlen, 2016). Close collaboration among different disciplines is an integral part of the multidisciplinary team approach for the management of CFA patients developed since the 1940s (Strauss, 1998; Vig & Mercado, 2015). The purpose of the teams is to assess and provide care that is organised and offers regular evaluation and treatment of the patient's holistic well-being (Pruzansky, 1953; Fox & Stone, 2013). A multidisciplinary team model has been proposed in CFA management as it builds on the assessment from all disciplines in the team and promotes multidisciplinary care (Ellingson, 2002). Due to the integration of different specialists, the team members become familiar with the expertise of different disciplines. They add to their assessment and combine all team members' findings to develop comprehensive treatment management. Communication among the multidisciplinary team members is essential and can be either formal or informal. Multidisciplinary collaboration (Brennan, 2001) continues to be the cornerstone in treatment management to date, as it significantly improves the treatment outcome and reduces the burden on caregivers and cost involved (Rocha et al., 2012; Fox & Stone, 2013). A wide range of problems related to the anomalies and the stresses they cause, the need for a sustainable team approach in order to continue rendering services to late adulthood (Berkowitz, 2010a).

1.2 THE RATIONALE FOR THE STUDY

The rationale for this study is to determine the nature and scope of the educational experience of maxillofacial and oral surgeons, orthodontists, plastic surgeons and speech-language therapists and the need for an educational strategy to improve teaching in CLP/CFA management. The method I used was a questionnaire to investigate the primary disciplines involved in CLP/CFA treatment management, including maxillofacial and oral surgery, orthodontics, plastic surgery and speech-language therapy. These disciplines are recognised by the American Cleft Palate-Craniofacial Association (ACPA 2016) as the core disciplines in CLP/CFA management (Hammond & Stassen, 1999). The research questionnaire (Appendix 2) provided necessary information about the demographic distribution and description of the clinical services of CLP/CFA multidisciplinary management in South Africa.

1.3 PROBLEM STATEMENT

There is a need to standardise the expertise and facilities to render CLP/CFA services (Bearn et al., 2001 & Williams et al., 2001). Treatment management complexity is due to the need for multidisciplinary management from birth to adulthood (Vig & Mercado, 2015). Education, clinical exposure, and experience of the service provider are essential factors in the treatment outcome (Nayar et al., 2015). South Africa currently has no published data on the status of CLP/CFA education and treatment management services. It became vitally important to conduct this study to establish evidence-based scientific data to assist in the strategic plan for education and health services rendered to CLP/CFA patients. South Africa relies partially on international charity organisations to render surgical services for CLP/CFA through a memorandum of understanding (MOU) (Operation Smile, 2006) with the Department of Health. With the popularity of these organisations' involvement in global health training (Nayar et al., 2015), the international charity organisations may be neglecting contributions to local education and a long-term multidisciplinary approach to CLP/CFA. Consequently, scarcity of skills and health budget constraints will cause an increased dependence on international charity organisations to render CLP/CFA services in South Africa.

1.4 SIGNIFICANCE OF THE STUDY

This study provided a better understanding of the current education in CLP/CFA, clinical exposure, and services available in South Africa. The data collected from the questionnaires will provide evidence-based scientific data and will assist in drawing up recommendations for strategic plans for CLP/CFA education and health-care services. Education is the guarantee to

establish new services and support for the continuation of the existing ones (Nayar et al., 2015). Although non-profit organisation programmes offer cooperative educational opportunities, there is insufficient emphasis on nurturing investigations and maintainable plans relating to universal health care (Taro et al., 2016). Establishing South Africa's educational strategy will reduce the burden on international organisations to render the services and add more potential partners to assist other countries. This study is based on a survey methodology and compensation to improve the overall outcome and response rate. The results may support a similar methodology in conducting online surveys for scientific research.

1.4.1 Objectives of the study

- Measure the exposure and knowledge level of the four main disciplines involved in CLP/CFA treatment.
- Evaluate services provided to CLP/CFA cases.
- Obtain an opinion from specialists and practitioners about the current CLP/CFA treatment management and educational needs.
- Determine the demographic distribution and treatment protocols of CLP/CFA treatment services in South Africa.

1.4.2 Research questions

The main research questions for the four selected disciplines in the management of CLP/CFA in South Africa are as follows:

- What is the extent of basic knowledge of CLP/CFA among the four main disciplines involved in treatment?
- What is the nature of their experience and education (i.e., theoretical, clinical, and team participation)?
- What is the demographic distribution of CLP/CFA services in South Africa?
- What are the treatment protocol variations in treating CLP/CFA patients?
- Is there is a need to improve CLP/CFA education and clinical skills?

1.4.3 Concept clarification

- Assess current knowledge and education by measuring the extent of CLP/CFA experience, teaching, and the description of services rendered.

- Examine the services and treatment protocol variations among practitioners in the management of CLP/CFA.
- Investigate the needs and demands for CLP/CFA education.

1.4.4 Assumptions of the study

The expectation from this research is that there is a need to establish an educational strategy for meeting the needs of CLP/CFA treatment services. This study will also provide information on the demographic distribution and treatment protocols of such services to assist in CLP/CFA education and services planning, using the available resources and expertise.

1.4.5 Delineation of the study

This study was conducted in two stages. In the first stage (pilot study), the survey questionnaire was assessed and adjusted by meeting with conveniently selected practitioners of the four main disciplines involved in treating CLP/CFA, who completed the survey questionnaire. The outcomes were used to adjust the core research tool (questionnaire). In the second stage, the online survey questionnaire was used, which measured the exposure, knowledge level, and services provided to CLP/CFA patients. The questionnaire was designed to delineate the demographics of cleft care providers and report their treatment protocols and experience.

1.4.6 Presentation of material

The results of the research project are presented in the form of four manuscripts. The manuscript format is in line with the requirements of the thesis submission of the University of Kwazulu-Natal, College of Health Sciences. These objectives guided the research process of undertaking the objectives that led to the generation of manuscripts. A total of four publication manuscripts were developed. Two oral presentations were delivered at scientific meetings (Appendix 11 and 12). The manuscripts are submitted to show how the objectives of the study were met and how the overall aim was achieved.

1.4.7 Summary

This first chapter review provided a background on the treatment complexity and multidisciplinary requirements of CLP/CFA. Therefore, it becomes increasingly important to investigate the need for an educational model for the professionals, as well as participation in an established cleft palate team. Consequently, academic education and the clinical training needs of professionals require an assessment of those professionals in order to improve care for

CLP/CFA patients. Attention must be given to gathering professional opinions regarding the participants' academic education and training in such fields and their views on achieving the confidence required to provide entrustable professional activities (EPA) (Ten Cate, 2005). This study introduced the concept of CLP/CFA academic education needs, and also pointed out the challenges and the benefits of providing dedicated academic training.

CHAPTER 2

2.1 LITERATURE REVIEW

2.1.1 Introduction

The practitioners involved in CLP/CFA treatment should be familiar with the available treatment provided by other disciplines involved in multidisciplinary care (Berkowitz, 2013). Teamwork education to develop efficient multidisciplinary care should be based on communication and cooperation to deliver a capable health-care services team (Garner, 1995). Dyer (2003), four stressed the need for a pedagogical educational model for Interprofessional Education (IPE) in order to acquire the skills needed for the team model healthcare (2003). For many years researchers and practitioners have understood the need to enhance the educational and clinical experience in treating all segments of society, to provide quality management, and improve access to care to underserved patients and their families (Dabed & Cauvi, 1998; Gadbury-Amyot et al., 2006). Recently, Isiekwe et al. (2016) published a study that assessed the craniofacial education of orthodontic residents. It showed that most of the residents had limited clinical experience in the management of CLP/CFA patients. Several studies recommended that residents be exposed to a multidisciplinary team approach for CLP/CFA patients' care, both academically and practically (Ranalli et al., 1984). Noble et al. (2012), reported that the extended period of treatment for CLP/CFA patients could restrict the educational fulfillment of postgraduate students during their limited period of study. They also reported that 56% of postgraduate students indicated an intention not to treat CLP/CFA patients because they felt unsure and had limited experience" (Noble et al., 2012).

Another study showed that 28,2% of postgraduates were less confident in treating patients with CFA (Brown & Inglehart, 2009). Researchers advocated that more clinicians should become involved in the treatment of patients with CLP (Berkowitz, 2010). Not only is education essential, but its combination with research is vital to monitor and improve treatment outcomes (Spriestersbach et al 1973, vallino et al 1992, Keim & Sinclair, 2002). A research practitioner is a significant multidisciplinary member in treating and laying the foundation for continued progress in the management of complex CFA patients (McCarthy, 2009). The value of treatment management relies on the teaching and exposure received at the beginning and throughout the practitioner's career (McDonald et al., 2000). Therefore, continuous assessment of education and services of CLP/CFA is necessary to provide a foundation for improvement and to attract the attention of educational institutes for such needs. In order to discover the educational needs and expertise available, it is necessary to collect the information that maps the services, locates

established teams and records the variation in sequencing, the timing of treatment, and the treatment protocols (Berkowitz, 2013; Cameron & Widmer, 2013; Bütow & Zwahlen, 2016). Survey research has been chosen in this study since it is a valuable tool to collect information about health-care education and services and to examine the quality and availability of care for CLP/CFA patients (Lass et al. 1973 & Cunningham et al., 2015). Literature highlights that a survey questionnaire for academic research response rate is valuable in reducing the non-response ratio, causing misinformation about questions addressed in a survey (Shih & Fan, 2008). In order to improve the response rate in online surveys, researchers suggested that incentives be used (Flanigan et al., 2008 & Cho et al., 2013). Current views also support the use of a combined mode methodology to respond to a survey in the practitioner's busy schedule (Cunningham et al., 2015). The literature identified several features that influence the reply ratio in online surveys (Fan & Yan, 2010). The investigator followed these recommendations for increasing the online survey response by explaining the survey benefits plainly, providing an accurate appraisal of the duration to complete the questionnaire, and providing contact details (Cho et al., 2013). Local or national organisations' endorsements were obtained to improve respondents' participation (Asch & Christakis, 1994).

2.2 KEY CONCEPTS

2.2.1 Introduction

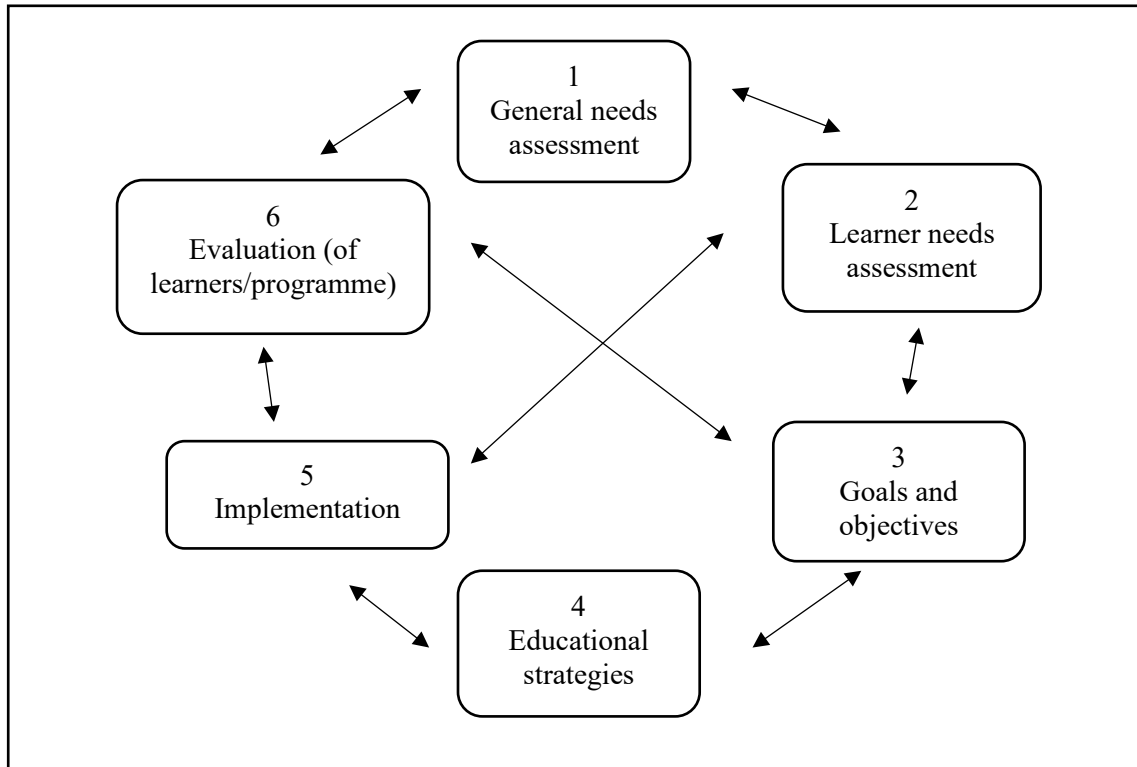
The theoretical perspectives in present and future possibilities of the academic education (Mann, 2011) has guided this study. By using various components that contributed to developing a conceptual framework to guide the data collection and data analysis. The framework incorporates the following components with each component being interlinked and intersecting with one another to form a workable system:

2.2.1.1 Kern's six-step approach to curriculum development (Kern et al., 2009) was used by the researcher to develop the study framework and the research phenomenon.

Multiple views of participants from the four different professional disciplines regarding the efficacy of academic education and investigating the needs and strategy to reach the goals (Fig.1) are obtained. This study begins with the identification of the adequacy of academic education concerning the management of CLP/CFA patients. Then, it relates to the professional's perspective on developing professionals who can provide expert care in that field. The complete problem identification required an analysis of the practitioner's academic training in addressing

the identified need. This was followed by professional opinions about an ideal approach that would describe how practitioners, academic education systems, and stakeholders should be addressing the need for CLP/CFA care.

FIGURE 1: Kern's (2009) six steps to curriculum development

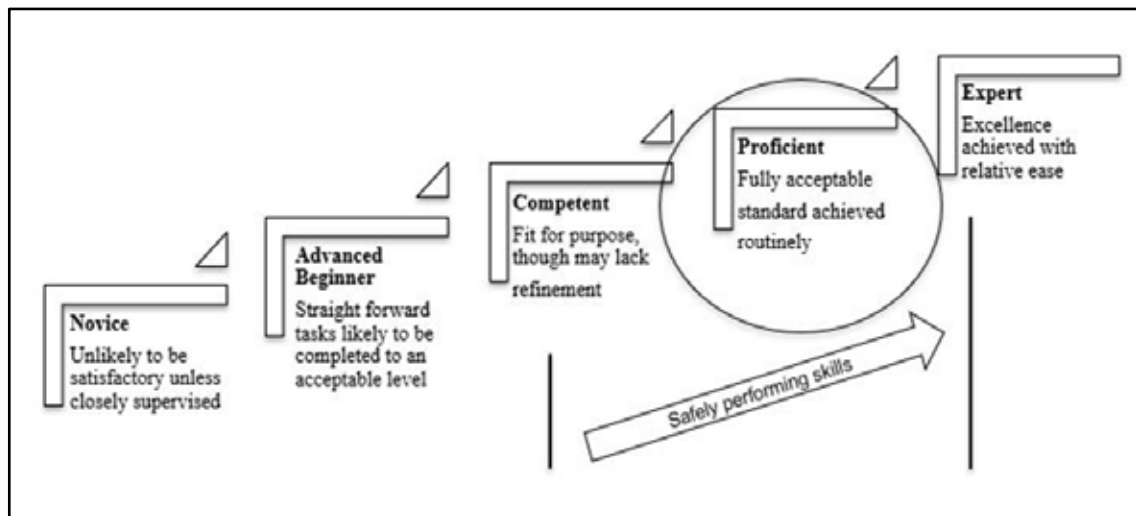


2.2.1.2 Theories of learning provide a foundation for understanding how learning occurs in producing different levels of professionals.

The five-stage model of skill acquisition, Dreyfus (2004) (Fig.2)

This concept identifies the trajectory of the learning pathway in order to develop safe treatment skills up to the level of experts. The first concept is the novice. Usually, the instruction process begins with the instructor decomposing the task into context-free features that the beginner can recognise. The second stage is the advanced beginner, where the learner recognises new aspects. Straightforward tasks are likely to be completed to an acceptable level. The third stage is competence, which is achieved by the learner through instruction or experience. Fit for purpose, though, may lack refinement. As a competent student becomes more competent, the fully acceptable standard is achieved routinely. The fifth concept is the clinician, who becomes even more competent. Excellence is achieved with relative ease.

FIGURE 2: Dreyfus model of skill acquisition



The need for interprofessional education (IPE)

- i. Training in the multidisciplinary environment needs an IPE approach that allows professionals to develop clinical skills from different disciplines.
- ii. The pedagogical learning approach is the knowledge and skills transfer through the interactions that take place during learning (Berragan 2011). This approach is useful for IPE for the holistic approach of CLP/CFA patients through learning, communication and understanding of one another's roles among multidisciplinary team members. Interprofessional training is a pedagogical approach aligning clinical training to the needs of CLP/CFA patient multidisciplinary care.

2.3 SUMMARY

This section presents the conceptual framework, which is based on the different theoretical approaches to conduct educational research. The study used a systematic approach to demonstrate how education and health providers could be linked. The health system informed the education system of the profile of health professionals required to meet the needs of society effectively. The education system is responsible for training and producing health professionals. By adopting an entrustable-based model with the academic education system could create various training opportunities to build the competencies required to effectively manage the CLP/CFA needs of the population seeking care through the health system.

Pedagogical practices reflect the theoretical perspectives and beliefs that professionals hold about learning. It is important because they influence most decisions about curriculum, training, and assessment.

CHAPTER 3

3.1 RESEARCH DESIGN AND METHODOLOGY

3.1.1 Research design

The research instrument was developed by the researcher and piloted by conveniently selected practitioners representing the four main disciplines involved in CLP/CFA management. The outcomes were used to adjust the core research tool (questionnaire). The structured questionnaire was developed to measure the exposure, knowledge level, and services provided to CLP/CFA cases. Captured responses were uploaded on the Qualtrics online platform; the data that was collected used a cross-sectional, quantitative study design. The questionnaire link sent by email (Appendix 4), explains the aim of the research and includes informed consent (Appendix 3). Four disciplines, namely maxillofacial and oral surgeons, orthodontists, plastic surgeons, and speech-language therapists were included in this study.

3.1.2 Methodology

3.1.2.1 Context

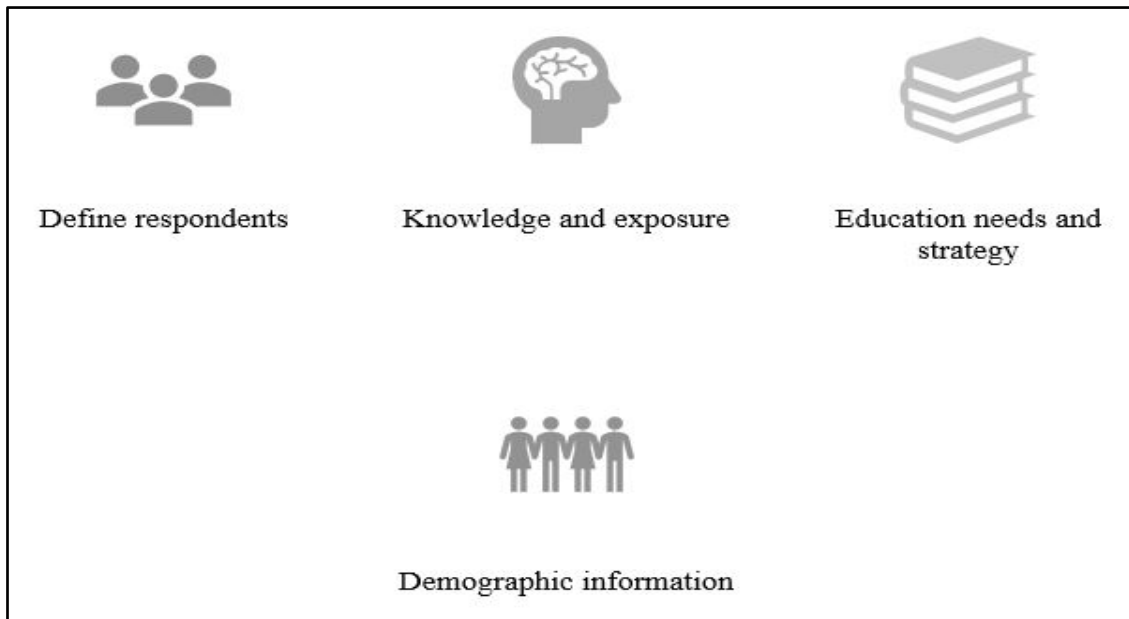
The research was conducted by South African practitioners using an online questionnaire developed by the researcher, using Qualtrics Research Suite Survey Software to capture and analyse the data. The questionnaire was distributed among the four main disciplines involved in treating CLP/CFA in South Africa, namely maxillofacial and oral surgery, orthodontics, plastic surgery, and speech-language therapy.

To facilitate a proper design of the core questionnaire, a qualitative phase (pilot study) was conducted personally with practitioners from the different fields of specialisation.

3.1.2.2 Questionnaire design

Four survey questionnaires were developed to suit each discipline, and they consisted of four sections. The first section defines the respondents, namely the four main disciplines involved in treating CLP/CFA. The second section is the knowledge, level of experience, procedures, and treatment protocol identified. The third section includes the educational need and strategy. The last section collects the demographic data, which includes the following: title, gender, age, degree(s), and location by region (Fig 3). Each discipline had a different question regarding the treatment and intervention section.

FIGURE 3: Questionnaire survey flow structure



3.1.2.3 Selection of participants

Practitioners in maxillofacial and oral surgery, orthodontics, plastic surgery, and speech-language therapy management were selected to participate in the study. The American Cleft Palate-Craniofacial Association Standards recognise these four disciplines as the main contributors to the treatment of CLP/CFA (Hammond & Stassen, 1999). Regarding sample size, the author used the literature as a guidance. The target sample size is 250, which is proportionally distributed among the four disciplines. The researcher chose the Medpages database (Medpages, 2016), which has 183 registered orthodontists, 149 maxillofacial and oral surgeons, 182 plastic surgeons, and 328 speech-language therapists. To improve the response rate a mixed-mode approach was used to collect the data. A telephone call was used to introduce the survey to the randomly selected practitioners. Using the randomly selected function (RAND) of Microsoft Excel (2013) gives one a stratified random sampling proportionate to a health care professional group. Another strategy used in collecting the data was during the annual scientific congress for orthodontists after obtaining permission from their professional society. A few of the professionals preferred using the email, which included the survey link and provided an accurate appraisal of the time it took to complete the questionnaire. It included email contact details in case the respondents needed help (Appendix 4). For orthodontists, the data was collected during their annual orthodontics scientific congress by two students, who recorded the data from the participants using an iPad. This was the most efficient method for study data collection.

3.1.2.4 Procedure

The researcher approached the societies of the four disciplines involved in treating CLP/CFA, namely maxillofacial and oral surgery, orthodontics, plastic surgery, and speech-language therapy to distribute the email, which includes a written consent to proceed to the questionnaire link. Before distribution, the questionnaire was piloted by conveniently selected practitioners from the four main disciplines treating CLP/CFA. They completed the questionnaire, which was subsequently revised based on the responses to ensure the appropriate capturing of data. The societies of the primary disciplines were approached to distribute the questionnaire to their members on their email database. It was intended that the questionnaire would be distributed twice during the first week, then weekly afterwards, until the required number of replies was reached, but that proved unnecessary because the target was reached early on.

3.1.2.5 Data collection

Qualtrics online survey platform was used to distribute the questionnaires and collect the data from the respondents. The number of potential respondents was limited, and they had limited time. Therefore, the researcher supported the data collection with telephone calls to collect the data and to remind and motivate respondents to complete the questionnaire.

3.1.2.6 Data analysis

Before the analysis, the researcher conducted data cleaning to identify outliers and extreme data. Based on this step, the researcher decided on using the descriptive data provided by Qualtrics. Upon ensuring data quality, the researcher used the Qualtrics Research Suite in basic data analysis to provide data tabulation and cross-tabulation with demographic data. Due to the comprehensive data reporting of Qualtrics, no further analysis was needed for this study.

The collected data from the quantitative study was discrete. The data summary included proportions, percentages, confidence intervals, and cross-tabulations as reported by some of the demographic variables. Associations between demographic variables, practice characteristics, and strategic approaches were investigated in higher-order tabulations. Regression techniques were not employed to describe these associations.

3.1.2.7 Data interpretation

The findings from the quantitative part (survey) answered the research questions. Based on the findings, the interpretation of data was guided by answering the key study questions of how the analysis and interpretation parts integrated.

3.2 ETHICAL CONSIDERATIONS

Ethics approval was obtained from the Social Sciences Ethics Committee of UKZN before commencing the study project (HSS/0235/617D) (Appendix 1). A copy of the research proposal was submitted for their examination and approval. The research adhered to the ethical guidelines of the University of KwaZulu-Natal relating to confidentiality, consent to conduct an online survey, and data management.

3.2.1 Gatekeeper permission

Gatekeepers permission was obtained from Medpages and professional societies to collect the data from their members before commencing the research study (Appendices 6 and 7).

Informed consent is an acknowledgement by the participant to take part in a research study, with an understanding of all risks and processes involved (Lonsdorf, 1988). The email used to distribute the survey link, included an introduction of the researcher, a brief description of the study, the aim and objectives, and contact details of the researcher. The survey included a request to read and approve the electronic consent before participating. Participation was voluntary, and participants were assured that they had the right to withdraw without any consequences. The researcher used the ethical guidelines of the University of KwaZulu-Natal to ensure confidentiality, and to obtain consent to conduct an online survey and use the information for research purposes.

3.2.2 Confidentiality

The signed consent form emphasised the significance of confidentiality and anonymity. Confidentiality of all participants was ensured by not revealing their identity. Confidentiality was maintained by assuring each participant that the information given was only accessible to the supervisor and the researcher. The recorded data from the questionnaire is saved and will be kept safely in a locked cupboard at the University of KwaZulu-Natal for five years. The storage data will then be burnt or destroyed, and the questionnaires will be deleted.

3.2.3 Dissemination of results

The findings of the study will be disseminated among relevant policymakers at UKZN and the Department of Health. Findings will also be presented at research symposiums and conferences both locally and internationally. Manuscripts from the study will be published as journal articles in peer-reviewed journals, both locally and internationally. Copies of published journal articles that emanated from this research will be distributed to all stakeholders involved in the research as feedback from the study. This will include the academics and professionals who participated in the study. A copy of the journal articles will be kept in the Westville library and the Joe Ryan library at the Oral and Dental Hospital for students and professionals to access.

3.2.4 Summary & Limitations

The methodology described the methods used for this study, providing information on the research questionnaire design and how the study addressed the research objectives. The sample selection from each discipline and the different approach for collecting the data were explained. Finally, a description of the data analysis process for the quantitative methods was given. The ethical section presented issues such as ethical approval of the study (Appendix 1), gatekeeper permission, informed consent (Appendix 3), and questions regarding confidentiality were described.

Limitations: This survey represents the opinions of those respondents of a profession who were willing to respond to the survey of a random-probability sampling. It is possible that those practitioners who received the survey and did not respond, did not feel that additional training in this field was needed or of concern. It could also be that some of the professionals did not respond due to their workload. The limitation can be considered a lack of verification with a low response of less than 50%. To justify whether the perceptions are valid or not, would only be possible if additional numbers of sampling were received as part of this proportionate stratified sampling.

The next chapter presents the manuscripts that developed from the study.

CHAPTER 4

4.1 RESULTS: MANUSCRIPT/PUBLICATION

4.1.1 MANUSCRIPT 1: Academic education of South African Maxillofacial and Oral Surgeons

4.1.1.1 Introduction

This manuscript has been submitted for publication in the South African Dental Association Journal with reference number SADJ/MS 934/2020. It describes the views and experiences of maxillofacial and oral surgeons' academic education in 2019 or 2020, and services related to cleft lip/palate and craniofacial deformities.

The manuscript addressed objectives 1 and 2 of the study, which was to determine the need for clinical training and the essential role it plays in enhancing clinical training of health professionals, hence forming a foundation on which this study is based, linking it to the main aim of the study.

The main findings of the study were that the participants in the study identified a lack in their exposure and training in the CLP/CFA field. However, the respondents believe that subspeciality training would enable them to provide adequate care for CLPCFAPatients.

4.1.1.2 Academic education of South African maxillofacial and oral surgeons in the field of cleft lip/palate and craniofacial deformities

E Ghabrial, K-W Bütow

Abstract

Background

Maxillofacial and oral surgeons (MFOS) are trained to manage hard and soft tissue conditions affecting the orofacial region. Therefore, they play an essential role in the health care of patients with cleft lip/palate (CLP) and craniofacial deformities (CFD). The complex and lengthy nature of CLP/CFD management requires collaboration among different disciplines. Consequently, it becomes increasingly important that the academic education available to MFOS provides in-depth knowledge, multidisciplinary participation and adequate clinical exposure provided by field experts.

Objectives

This study aimed to investigate the exposure and knowledge level of MFOS regarding the management of CLP/CFD. A second objective was to obtain an opinion from practising MFOS about the academic educational needs of those working with CLP/CFD.

Methods

An online survey and telephone interviews (using a structured questionnaire) were used to investigate the level and scope of the MFOS' academic education and to determine their academic needs.

Results

The questionnaire was completed by 46,3% of practising MFOS on the Medpages health-care provider database, 64,8% of whom had more than 10 years of professional experience. Of the respondents, 60% showed a good general knowledge of CLP/CFD. However, 66,5% acknowledged that they had received only limited clinical training and exposure, which prevented them from providing adequate services to CLP/CFD patients. Only 41% of the respondents offered primary and/or secondary treatment for both CLP and CFD patients, and 53,8% of them had participated in multidisciplinary teams. All the respondents agreed on the need for a dedicated training programme(s) in CLP/CFD management, and the majority recommended a sub-speciality training either by degree courses or clinical certification.

Conclusion

This study demonstrates that postgraduate academic training and clinical exposure are limited in the CLP/CFD fields. All the respondents agreed that an educational strategy to meet the needs of MFOS providing CLP/CFD care should be established. Participants suggested that part-time clinical and degree courses should be developed.

Keywords: maxillofacial and oral surgeon, cleft lip and palate, cleft lip, alveolus and palate, multidisciplinary, education, survey for dental professions.

Introduction

Surgical care for cleft lip/palate and craniofacial deformities (CLP/CFD) contributes to the global cost of disease, making many patients unable to access adequate surgical care.¹ This is due to the shortage of human resources for surgical care, inadequate surgical capacity and finance in developing countries (including South Africa).² CLP/CFD surgery is one of the necessary surgeries that needs to be performed consistently around the world.³ The maxillofacial and oral surgeons' (MOFS) role is essential in caring for children born with CLP/CFD deformities.⁴ These surgeons are trained to manage both hard and soft tissue conditions affecting the orofacial region in order to achieve optimal functionality and aesthetically pleasing outcomes⁵ and to avoid midfacial dysgnathia as far as possible.⁶ Consequently, dental professionals prefer that MFOS manage CLP/CFD deformities.⁷

For many years, researchers and practitioners have understood the need to gain educational and clinical experience of treating all segments of society in order to provide quality management and improved access to care for all patients.⁸ One of the earliest attempts to assess the exposure of medical and dental students to CLP treatment was by Lass et al.⁹ using a survey questionnaire. The main finding was that students lacked clinical exposure and basic theoretic education.⁹ Spriestersbach et al.¹⁰ acknowledge the effects of limited training in CLP management and advise that a clinician with limited training should not manage individuals with CLP.

These patients commonly have challenging health issues because of additional complexities related to their skeletal, soft tissue and facial problems. This makes it more challenging to handle such patients because a single discipline cannot make all treatment decisions.¹¹ Close collaboration between different disciplines is an integral part of the multidisciplinary team approach for the management of patients. It has also been advocated by practitioners.¹² Therefore, practitioners involved in CLP/CFD should be educated not only in their fields but also in the treatment provided by other disciplines involved in multidisciplinary care.¹³ As a result, the training of a multidisciplinary team member needs interprofessional education using a pedagogical model for successful skills transfer and cooperation within the team model.¹⁴ Not only academic education is essential but also participation in research in order to monitor and improve treatment outcomes.¹⁵

The value of treatment management relies on the training and exposure that the student received at university and the knowledge gained throughout the practitioner's career. Subsequently, feedback on the education received, and further training is necessary to provide a foundation for the improvement of educational courses, which will lead to better health services.¹⁶

Objectives

- To measure the exposure and knowledge level of MFOS in the management of CPD and CFD.
- To obtain an opinion from MFOS about current CLP/CFD academic educational needs.

Methods

Ethical permission was obtained from the Humanities and Social Sciences Research Ethics Committee (HSSREC) of the University of KwaZulu-Natal. The research survey was completed by South African MFOS who consented to participate in the study, using an online questionnaire to investigate the academic education provided to CLP/CFD practitioners. A quantitative research method, using a 51-item structured questionnaire, was developed. Qualtrics Research Suite survey software was used to capture and analyse the data. The questionnaire was designed to collect quantitative data using a Likert-type scale, which was explained telephonically to each practitioner. Consent for participation was obtained from each respondent prior to their completing the questionnaire. The data was collected either online or during a telephone interview, according to the preference of the participant.

Questionnaire design

The questionnaire consisted of a statement of consent to participate, followed by four sections: the first determined whether the participants would be accepted for inclusion in the study. The second section collected their level of knowledge and experience. In the third section, their needs and preferences regarding further education were determined. The last section collected demographic data, which included title, gender, age, degree(s) and location by region.

Selection of participants

A random sample of MFOS was obtained from the Medpages active practitioners' database.¹⁷ The sample was randomly selected from the list using Microsoft Excel (2013). On the advice of a statistician, the number of participants selected were to represent all MFOS in South Africa, with a sampling error of approximately 15%.

Before distribution, the questionnaire was piloted by a conveniently selected sample of practitioners and subsequently revised based on their responses in order to ensure appropriate capturing of data. The researcher then approached the South African Society of Maxillofacial and Oral Surgeons (SASMFOS) to distribute the survey by email. Initially, the questionnaires were to be distributed by the Qualtrics online survey platform twice during the first week, then weekly

afterwards. This proved to be unnecessary, as the targeted participant number was achieved by randomly contacting 56 MFOS on the Medpages database.

Data analysis

The data captured using Excel 2013 was converted into Stata 15 s (string) format. The analysis undertaken was a descriptive summary of statistics presenting frequencies and associated percentages. No further analytical tools were used because no hypothesis was tested.

Results

The questionnaire was completed by 46,3% of the MFOS listed in the Medpages database, representing most South African provinces, with the highest participation from Gauteng (44,2%), the Western Cape (19,2%), KwaZulu-Natal (17,3%) and the Eastern Cape (7,6%) (Fig.1). The distribution of participants according to years of experience showed that 64,8% had more than 10 years, 20,3% had five to ten years' professional experience and the rest had less than five years (Fig. 2). When asked general questions about the incidence and distribution of CLP, only 62% showed good general knowledge. Regarding CLP/CFD academic education, the participants noted that, during their postgraduate studies, 38,8% had received some clinical exposure, and 40,7% had participated in CLP/CFD multidisciplinary and discussion meetings. A total of 61,1% gained their knowledge from textbooks, and 57,4% received their information from lectures (didactic input) (Fig 3).

Regarding services to CLP/CFD patients, 57,4% of the professionals did not offer surgical treatment for CLP or CFD patients. When asked to name the factors that prevented them from treating CLP/CFD patients, 66,7% acknowledged that it was due to their limited clinical experience and training, 12,5% mentioned the long duration of the treatment, 10,4% cited lack of interest, and 10,4% mentioned the need for multidisciplinary treatment (Fig. 4). All the respondents agreed on the need for dedicated academic training programmes for CLP/CFD management. Of the respondents, 42,1% suggested degree/certificate courses, while 36,8% proposed non-degree clinical fellowships and the rest recommended continuing professional education (Table 5). For degree and non-degree clinical fellowship courses, the respondents suggested that admission requirements should include at least one professional degree. A total of 85,1% said that health professional registration was essential, whereas 44,4% placed emphasis on years of clinical experience, and 22,2% suggested writing an admission examination (Fig 6). When the participants asked about their motives for enrolling in such a programme, 46,7% identified interest and passion, 20,1% liked the idea of joining a multidisciplinary team, 14,7%

mentioned alleviating community needs, 12,4% wished to receive a degree, and only 5,9% wished to improve their income (Fig 7). The participants had various views regarding the essential aspects of the goals and objectives of training programmes. However, the majority agreed that diagnosis and treatment planning, clinical skills and multidisciplinary exposure are essential. Teamwork skills were valued by 79,6%, whereas 68,5% proposed special needs care, 44,4% recommended some research experience, and 31,4% suggested participation in charity missions (Table 1). Regarding the form of evaluation, 88,8% recommended keeping a logbook of clinical hours, 79,6% suggested a written/oral examination, 49% suggested assignments and 29,6% proposed publication in a scientific journal as a vital evaluation method (Fig. 9).

Discussion

To our knowledge, no survey has been undertaken in South Africa to investigate the opinion of MFOS about academic education in the field of CLP/CFD. However, such surveys have been conducted among other specialities in other parts of the world.^{9,18}

This survey is in contrast with other survey studies, for health professionals, where they used samples from the national database for professionals.^{19,20} In this study, participants were obtained from a list of active MFOS in a privately managed Medpages health-care database, which is regularly updated to provide a true reflection of the practising MFOS.¹⁷ The sample was randomly selected from the Medpages database. It included practitioners from different locations and places of employment, in order to overcome limitations and to obtain general opinions from all clinicians.

It is recognised in the literature that it is difficult to receive adequate response rates in surveys of medical practitioners.²¹ Some researchers have used email or postal questionnaires, and others have used incentives to improve the response rate.²² In this study, the 46,3% response rate achieved by using a mixed method of data collection using both telephone interviews and email, which provided a wide distribution not limited by email access, was in line with recommendations by Flanigan et al.²³

This agrees with the findings of other disciplines regarding CLP/CFD academic education.^{24,25} The study found a limited emphasis on clinical training and multidisciplinary exposure during academic graduate programmes. Consequently, graduate students may leave with limited education in the CLP/CFD fields.²⁶ Accordingly, this study revealed a strong desire among South

African MFOS for professional development and the need for a dedicated educational programme(s) in the CLP/CFD field.

CFD surgery programmes are available in different parts of the world as a sub-speciality obtained by a clinical fellowship residency.²⁷ Responses in this study show that 79,9% recommended a fellowship and certificate programme. Concerning the length of such a programme, the respondents were equally divided between one and two years, which is partially in line with the minimum 12 months of fellowship residency recommended by Silvestre et al.²⁸ This is similar to the current recommended structure of fellowships in different parts of the world.^{29,30} The majority of the respondents recommended that the training should place more emphasis on discussions and clinical contact, with evaluation using formal examinations and clinical hours logbooks.

The respondents agreed with the findings of other studies that participation in a multidisciplinary team is vital in order to produce surgeons who are capable of providing safe, efficient and effective care for those affected with CLP/CFD.²⁷ Therefore, such comprehensive training can only be offered by a multidisciplinary CLP/CFD centre, where a high volume of craniofacial surgical procedures is performed by experts in the field.³¹ As stated by Egro et al.,³² candidate selection criteria should include professional degrees, the number of years qualified and possibly even an admission examination. However, the respondents did not consider other requirements such as research experience and publications in candidate selection. This is in contrast with Grewal et al.,³³ who state that scientific publication is a good indicator of those who will be willing to provide fellowship mentoring and education. However, the respondents in this survey recommended that the selected candidates must have interest and passion and should be planning to join an established craniofacial team. These could be essential factors in building much-needed institutional capacity.

Conclusions

There is a need to establish an educational strategy for MFOS in CLP/CFD surgery to ensure they are competent and can, therefore, provide multidisciplinary services for CLP/CFD patients. This study revealed that many practitioners are enthusiastic about and willing to enrol in training programmes to prepare them to deliver the best clinical care in CLP/CFD management. This study also provided information about candidate selection criteria, education objectives and evaluation of such programme(s). Our findings are that, to be able to offer such education programme(s) in South Africa, MFOS, academicians, practitioners and professional societies need to collaborate. It is necessary to maintain and develop craniofacial centres where a high volume of CLP/CFD,

surgical procedures are performed, and where enough experts are employed. This will provide sufficient training for the candidate not only to be able to provide ideal and comprehensive services for CLP/CFD patients but also to assume leadership positions in a multidisciplinary team.

4.1.1.3 References

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4.1.1.4 Figures and tables

FIGURE 1: Respondent distribution according to province

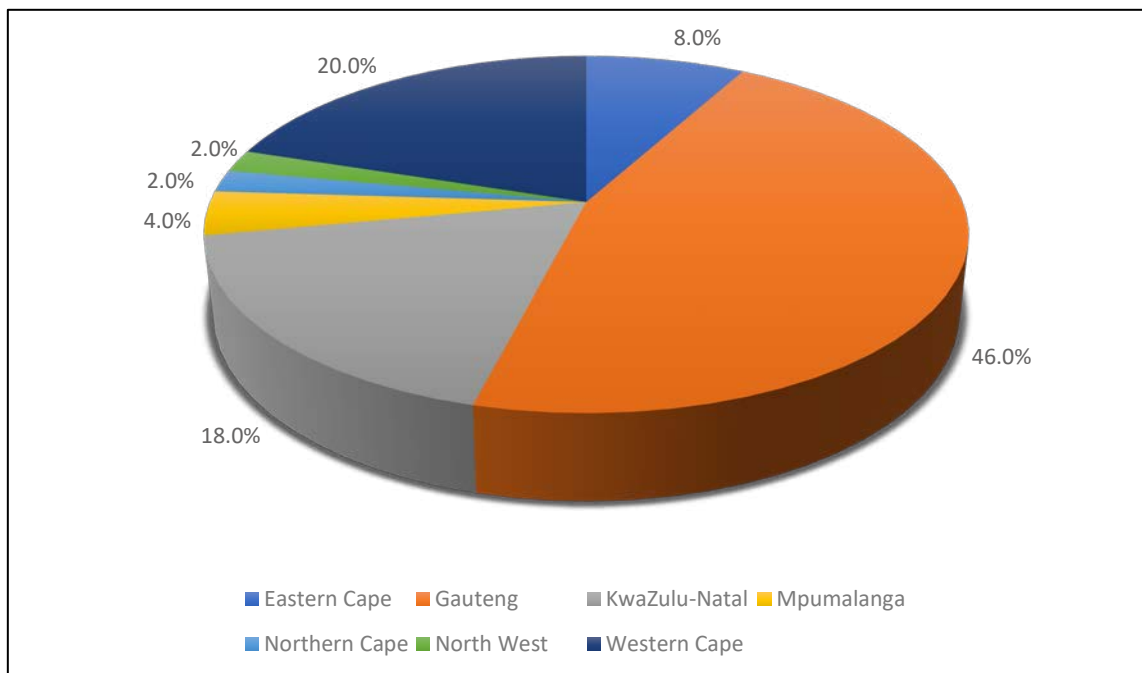


FIGURE 2: Respondent distribution according to clinical experience

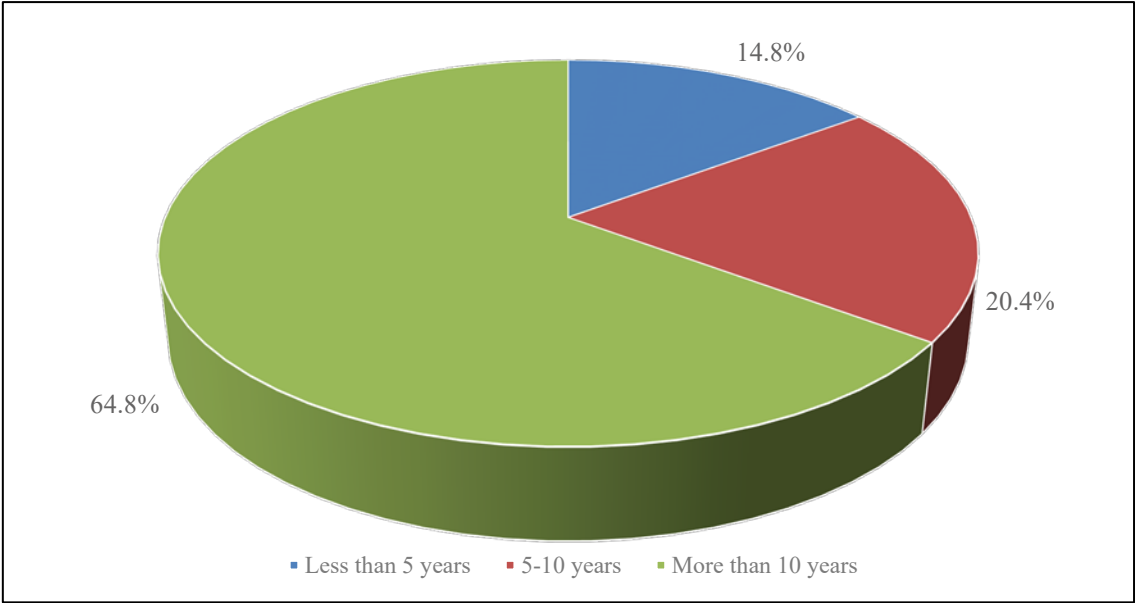


FIGURE 3: Did your postgraduate programme include any of the following in the management of CLP/CFD?

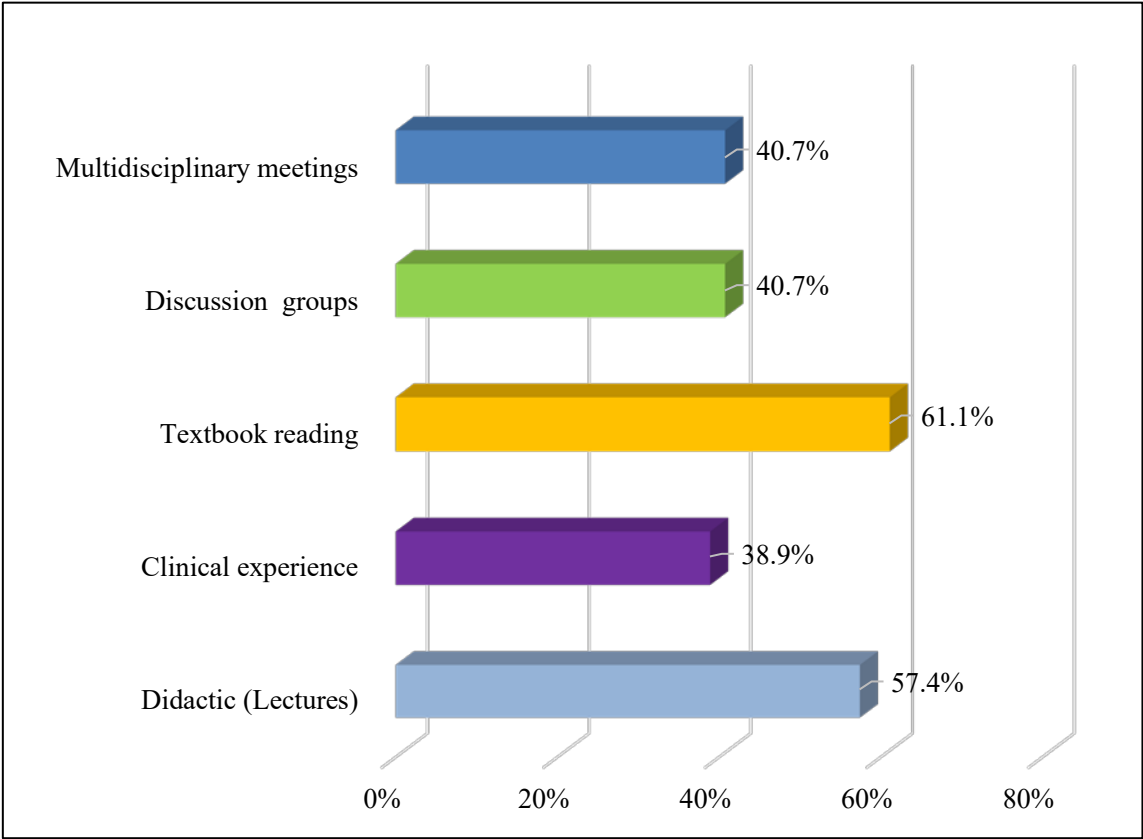
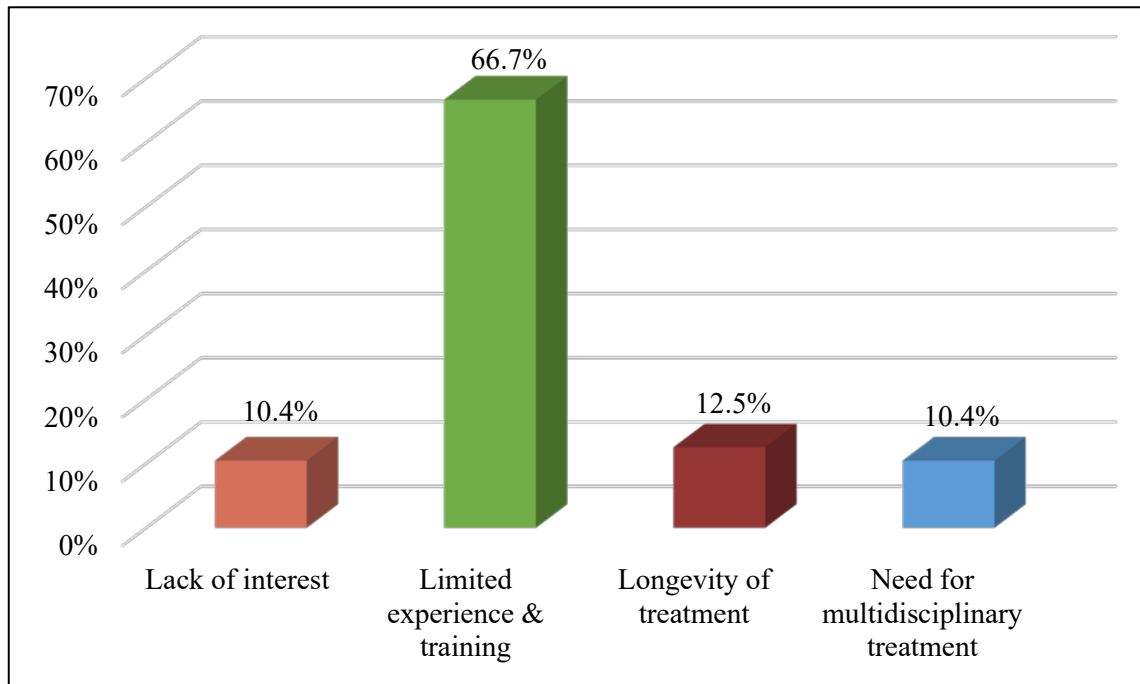


FIGURE 4: Reasons preventing MFOS from adequately treating CLP/CFD patients



MANUSCRIPT 1 - TABLE 1: Type of course recommended (percentages)

Degree course, diploma, master's and fellowship certification	42.1
Non-degree course fellowship training (only)	36.8
CPD courses	21.0

FIGURE 5: Admission requirements for the degree(s) and clinical fellowship courses

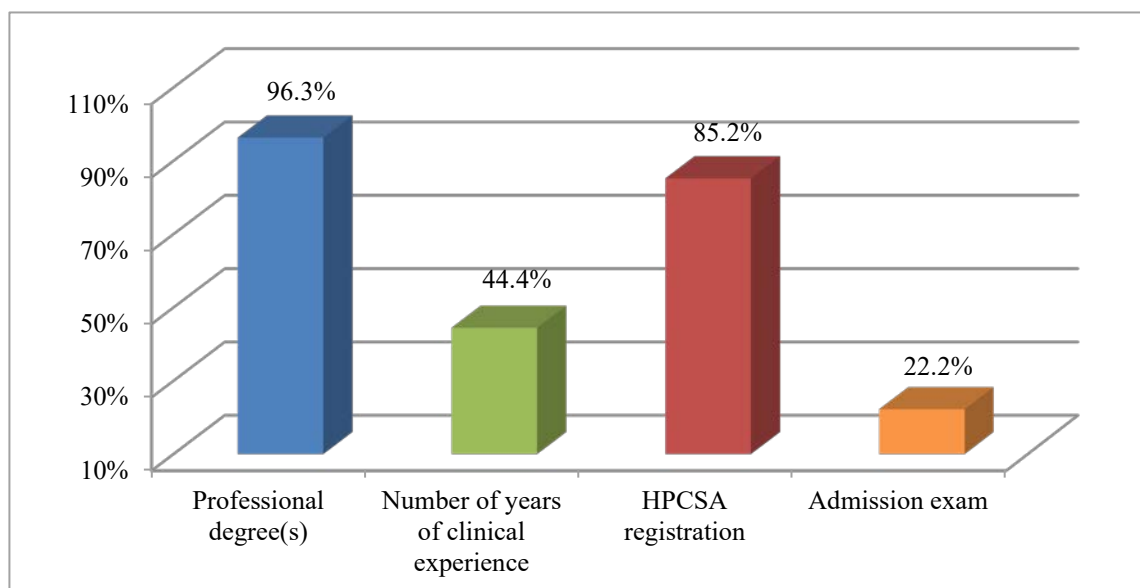
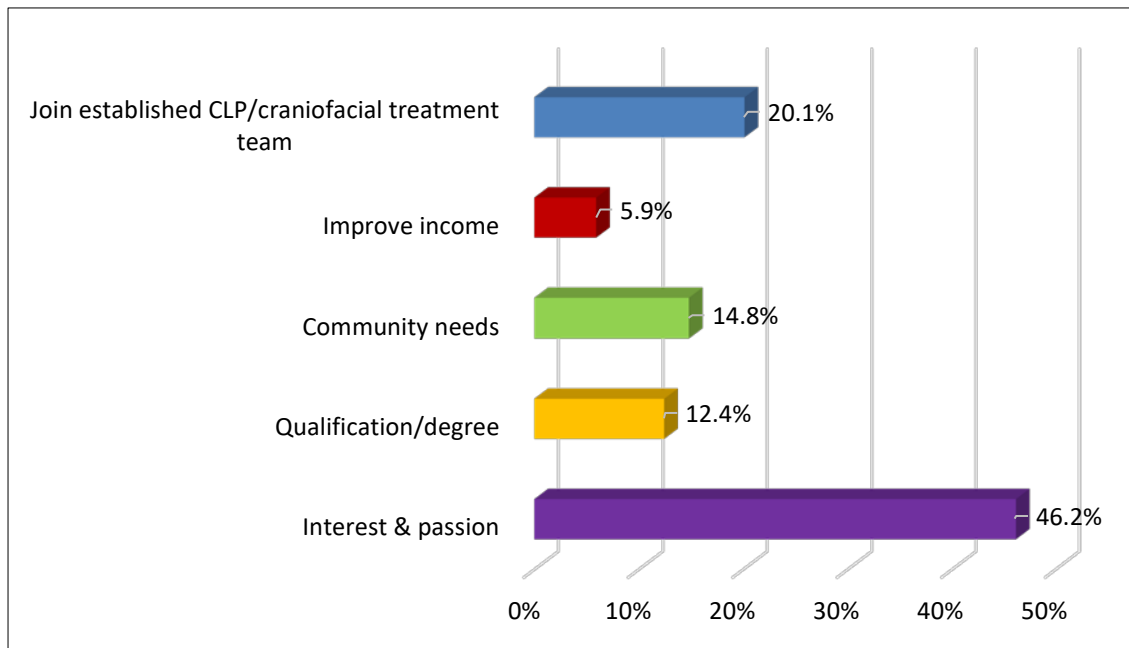


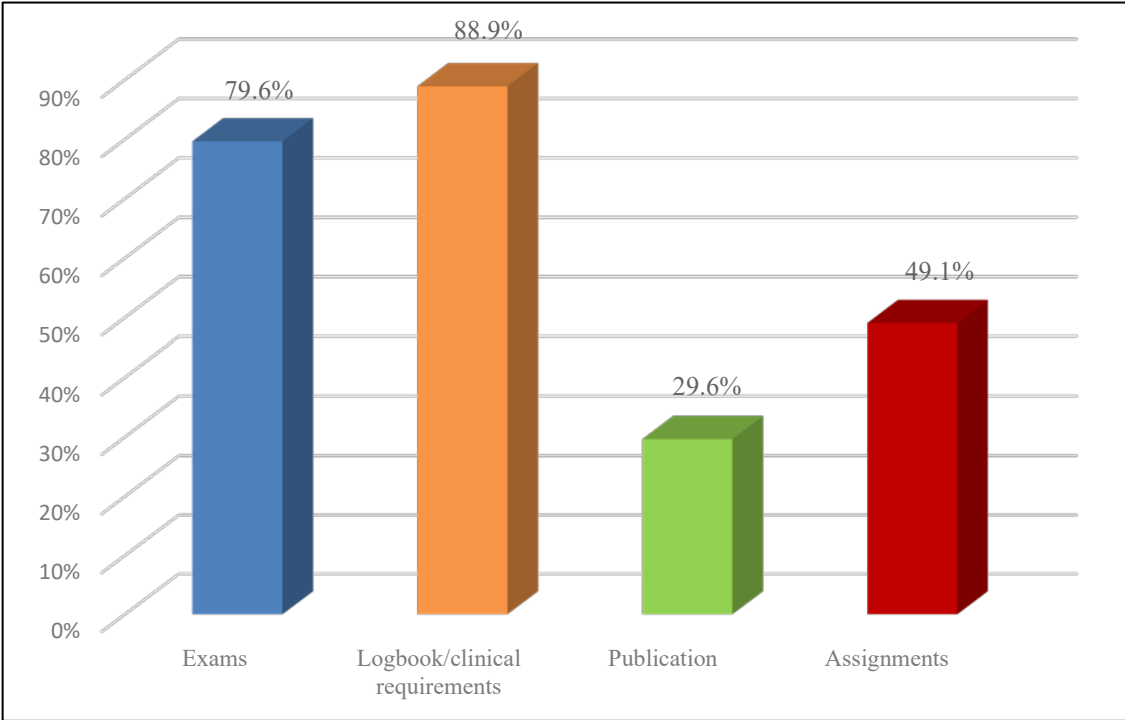
FIGURE 6: Candidates' reasons for enrolling in a CLP/CFD postgraduate course



MANUSCRIPT 1 - TABLE 2: The goals and objectives of postgraduate training programmes (percentages)

In-depth knowledge	98,1%
Diagnosis and treatment planning	100%
Clinical skills	98,1%
Multidisciplinary approach	88,8%
Research	44,4%
Special needs care	68,5%
Teamwork skills	79,6%
Participation in charity missions	31,4%

FIGURE 7: Forms of evaluation for a degree(s) and clinical fellowship courses



4.1.2 MANUSCRIPT 2: South African speech-language therapists' opinion of their training

4.1.2.1 Introduction

This manuscript has been submitted for publication in the South African Communication Disorder Journal and has the reference number SAJCD Submission 695/2020. It described the views and experiences of speech-language therapists' academic education and services related to cleft lip/palate and craniofacial deformities.

The manuscript addressed objectives 1 and 2 of the study, which was to determine the need for clinical training essential role it plays in enhancing clinical training of health professionals, hence forming a foundation on which this study based, linking it to the main aim of the study.

The main findings of the study were that the participants in the study identified a lack in their exposure and training in the CLP/CFD field. However, they believe that continuing professional education courses (CPD) and workshops would meet the needs of the health system challenges to be able to provide adequate care for CLP/CFD patients.

4.1.2.2 South African speech-language therapists' opinion of their training in cleft lip and palate and craniofacial deformities

Abstract

Background

Speech care of cleft lip/palate and/or craniofacial deformities is complex and lengthy and requires collaboration among different disciplines. Consequently, it becomes increasingly important to provide academic educational models that include didactics, online learning and clinical exposure in cleft lip/palate and/or craniofacial deformities treatment, and participation in established cleft palate multidisciplinary team management.

Objectives

To obtain speech-language therapists' opinion regarding their cleft lip/palate and/or craniofacial deformities academic education. Also, to determine the professional services that SLT offer patients with cleft lip/palate and/or craniofacial deformities and the educational needs of SLT in this field.

Methods

A 43-item online survey to collect quantitative data was conducted by telephone and e-mail using a randomised sample of speech-language therapists in different areas of South Africa.

Results

The questionnaire was completed by 123 speech-language therapists, 70% of whom had more than ten years of professional experience. Of the respondents, 80,8% acknowledged their limited clinical exposure during their academic education. Only 42,4% of the professionals offer treatment for patients with cleft lip/palate and/or craniofacial deformities. Of the respondents, 96% agreed on the need to improve the academic education relating to cleft lip/palate and/or craniofacial deformities, and the majority recommended certified courses, continued-education workshops and online courses.

Conclusion

The findings indicate that speech-language therapists' academic training is significantly limited in the cleft palate and craniofacial fields. Therefore, there is a strong need at undergraduate level for clinical training and exposure to multidisciplinary management. At postgraduate level, there is a need to establish an educational strategy to meet the needs of speech-language therapists providing cleft lip/palate and/or craniofacial deformities care. Participants suggested that programmes for continuing professional education, degree courses and online resources be designed to provide practising clinicians with updated information and guidance in the management of cleft lip/palate and/or craniofacial deformities patients.

Keywords: speech-language therapist, craniofacial disorder, cleft palate, cleft lip, multidisciplinary, education, professional development, survey

Introduction

Speech therapy is considered a core service in the management of cleft lip/palate (CLP) and craniofacial deformities (CFD) since young children with CLP are at considerable risk of suffering from delayed or disordered communication development (American Cleft Palate-Craniofacial Association, 2009; Hammond & Stassen, 1999). The role of the speech-language therapists (SLT) dealing with children with CLP and/or CFD is essential, not only to achieve the maximum communication potential but also in the management of swallowing and feeding (Evens & Louw, 2015; Fair & Louw, 1998; Peterson-Falzone, Trost-Cardamone, Karnell & Hardin-Jones, 2016).

For many years, researchers and practitioners have understood the need to enhance academic education and clinical experience regarding CLP and CFD in order to provide quality management and improve access to care for all patients and their families (Dabed & Cauvi, 1998; Gadbury-Amyot, Simmer-Beck, McCunniff & Williams, 2006). One of the earliest attempts to evaluate academic education in the CLP field was made by Lass et al., (1973) to assess the exposure of university academic students to CLP treatment by means of a questionnaire. The main finding was that there was a lack of clinical exposure and basic theoretic education. This was the same as the findings of Vallino, Lass, Pannbacker, Klaiman & Miller (1992) on the effects of limited academic training in CLP management. They advise that a clinician with limited training should not manage individuals with CLP.

CLP patient care relies on the teaching and exposure that the student received at university and the knowledge gained throughout the practitioner's career (McDonald et al. 2000; Wium & Louw, 2013). Therefore, continuous evaluation of the academic education and services provided for CLP and CFD is necessary to provide a foundation for the improvement of educational resources. Because opinion research is affected by the perception of society (MearaGlynn & Ostman 1995), it becomes necessary to obtain the individual opinions of SLT regarding the current knowledge in the CLP field and also to determine the educational needs of those providing services to CLP and CFD (Cameron & Widmer, 2013).

Objectives

To obtain speech-language therapists' opinion regarding:

- the CLP and CFD academic education of speech-language therapists (SLT);
- the professional services that SLT offer to CLP and CFD patients; and
- the educational needs of SLT in this field.

Methods

Ethics permission was obtained from the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal (HSS/0235/017D). The research survey was completed by South African SLT using an online questionnaire to investigate the academic education and services provided to CLP and CFD patients. A quantitative research method using a 43-item structured questionnaire was developed. Qualtrics Research Suite survey software was used to capture and analyse the data. The questionnaire was designed to collect quantitative data using a Likert-type scale, which was introduced to each practitioner by means of a telephone call. Consent for participation was obtained from each respondent prior to completing the

questionnaire. The data was collected either online or in a telephone interview, according to the preference of the participants. A random sample of SLT was obtained from the Medpages database registry for practising health care professionals (Manana, Kuonza & Musekiwa, 2018). Regarding sample size the author used the literature information (Modi & Ross 2000; Thandeka, 2016) as a guide for the response rate. This was reviewed upward to 18,83% of the Medpages' practising SLT to account for a possible sampling error of 15%.

The questionnaire was piloted by selected practitioners. They were invited to complete the questionnaire, which was subsequently revised based on the responses, to ensure appropriate capturing of data. Initially, the questionnaires were to be distributed by e-mail using the Qualtrics online survey platform. This proved to be unnecessary, since the target participant number was achieved by contacting 123 SLT on the Medpages database randomly by telephone.

Questionnaire design

The questionnaire consisted of four sections: the first determined whether the participants were appropriate for inclusion in the study. The second section collected the level of knowledge, experience, and services provided by the participants. In the third section, their educational needs and preferences regarding further education were determined. The last section collected demographic data, which included title, gender, age, degree(s) and location by region.

Data analysis

The data was captured using Excel 2013. This was later converted into Stata 15 s (string) format. The analysis undertaken was descriptive summary statistics presenting frequencies and associated percentages. No further analytical tools were used because no hypothesis was being tested.

Results

The questionnaire was completed by 123 SLT, representing most of South Africa's provinces (Fig. 1). Of these practitioners, 70% had more than ten years of professional experience (Fig. 2). From the basic knowledge questions about CLP, 39% of the respondents were uncertain of the correct answers. When asked about their educational experience, only 9% stated that they had clinical exposure during their undergraduate education and 13% during postgraduate education. Only 8% at undergraduate level and 13% at postgraduate level participated in multidisciplinary meetings during their academic education. Regarding didactic exposure, only 10% of the undergraduates and 59% of the postgraduates had some exposure (Fig. 3).

Just 44,35% of the respondents offered services for both CLP and CFD patients, and 41% of them participated in multidisciplinary teams. Regarding the services provided according to patients' age group, only 10 of the participants offered assessment and intervention to infants. The rest offered services to children from the age of four years to adult. When the respondents were asked about the facility where CLP patients were consulted and treated, the following emerged: private practices 47,37%, private hospitals 24,21%, and academic/government hospitals 25,26%. Only three of the respondents offered their services at special schools and government clinics.

The 53 respondents who stated that they offer an assessment, as well as treatment, were asked about the complexity of CLP and/or CFD patients. They acknowledged that it is exceptionally difficult to treat these patients and that it requires special training.

When asked why there is a need for special training, they indicated that it is due to the multidisciplinary approach needed (35,34%), the lengthy treatment (34,48%), and patients' socio-economic situation (25%). In the open-ended questions, a few respondents cited the emotional state of the family and patients as an additional complicating factor.

When the non-treating respondents were asked to highlight the factors preventing them from treating CLP and CFD patients, 44,14% stated that it was due to limited training and experience, 22,52% admitted lack of interest, 18,92% stated that it was due to low referrals, and 12,61% highlighted the length of the treatment (Fig. 4).

Almost all the respondents agreed on the need to improve the academic education offered to CLP and CFD treatment providers, and 97% of the respondents recommended dedicated academic training programmes in that field. Of the respondents, 62% would like to further their knowledge of CLP and CFD management.

When participants were asked about the preferred method of education, the majority (74%) recommended short courses and workshops; 21% recommended part-time certificate courses; 3% recommended full-time studies; and only 2% recommended digital learning (Fig. 5).

Participants identified interest, passion and the prospect of joining an interdisciplinary team as the most significant reasons for enrolment in CLP- and CFD-dedicated courses. When asked about a certificate course, the participants suggested that the focus should be on assessment, treatment planning, clinical skills, and an interdisciplinary approach. Keeping a logbook of the

hours spent in clinical training, as well as participating in examinations, were generally recommended as effective evaluation methods for certificate courses (Fig. 6).

Discussion

As indicated by Callahan and Hazelwood (2004), as the speech-language therapy field widens, the less frequently seen CLP and CFD patients present a challenge for academic training and practitioners because of decreasing emphasis on academic education and changes in the scope of practice in some countries. In this survey, most of the respondents received an academic education that included mandatory course work. This is in line with the findings of Vallino, Lass, Bunnell and Pannbacker (2008). Despite this, respondents expressed the need for further training and clinical exposure to make them competent to provide services to CLP and CFD patients.

Survey distribution

Some previous SLT surveys, e.g. Pannbacker, Lass, Scheuerle and English (1992), used e-mail or postal questionnaires. Others used incentives to improve the response rate (Bedwinek, Kummer, Rice & Grames, 2010). This study used a mixed method of data collection: telephone interviews and e-mail provided wide distribution not limited by e-mail access, in line with recommendations by Flanigan, McFarlane and Cook (2008). By targeting a number of responses to obtain a statistically valid number, it was possible to reach the required number with less concern about a low response rate than that experienced by Asch, Jedrzejewski and Christakis (1997).

Sample

In similar studies, Pannbacker et al. (1992) surveyed SLT who were members of the American Cleft Palate Association. The sample in the study by Bedwinek et al. (2010) comprised SLT from selected schools. These surveys provided valuable information but did not include any other types of SLT. In this study, attention has been given to including information obtained from SLT with varied years of experience, from various locations and places of employment, in order to overcome limitations and to obtain general opinions from all clinicians.

Current academic education

This study found a limited emphasis on general knowledge and clinical exposure during academic graduate programmes. This is in line with the findings of Callahan and Hazelwood (2004) and Kuehn, Kummer, D'Antonio and Karnell (2006), that graduate students may leave with limited education in the CLP fields. This study found similar data on academic education with limited

clinical and multidisciplinary exposure. The findings are in line with those of Pannbacker, Lass and Starr (1979), demonstrating that practitioners who are legally qualified to provide treatment really know very little about these deformities.

Educational needs and strategy

This investigation revealed a strong desire among SLT for professional development and dedicated educational programmes in the areas of assessment and intervention with children born with CLP and CFD, in line with the findings of Vallino et al. (2008). Most respondents preferred practical information and multidisciplinary exposure related to CLP and CFD patients. Of the respondents, 73,78% ranked continuing professional development as a preferred way of obtaining information, and 32% recommended a certification programme of 12 to 24 months. This contrasts with the finding of Bedwinek et al. (2010) that web-based education and conferences are the preferred methods of continuing education.

Conclusion

As the SLT field widens, it leads to less education in uncommon problems like CLP and CFD. SLT may be confronted with the need to provide services that are not covered by their training and experience. Thus, it is essential for SLT to know how to assist the patient and communicate with appropriately trained professionals. This study shows that there is a need from SLT practitioners for continuing education and certificate courses in the CLP field. Consequently, academic institutions need to adopt educational strategies and provide resources for under- and postgraduate students and practitioners. Nevertheless, knowledge exchange through online communities will benefit a wider range of SLT (Karnell, Bailey, Johnson, Dragan & Canady, 2005).

Limitations

This survey represents the opinions of those SLT who were randomly selected and willing to respond to the survey. It is possible that those SLT who received the survey and did not respond did not feel that additional training in this area was a need or concern. The number of respondents who preferred recording their response by telephone interview or the online questionnaire was not registered as it was not part of the study objectives. Results are not based on the number of patients with CLP and/or CFD that they manage.

CHAPTER 2

2.1 LITERATURE REVIEW

2.1.1 Introduction

The practitioners involved in CLP/CFA treatment should be familiar with the available treatment provided by other disciplines involved in multidisciplinary care (Berkowitz, 2013). Teamwork education to develop efficient multidisciplinary care should be based on communication and cooperation to deliver a capable health-care services team (Garner, 1995). Dyer (2003), four stressed the need for a pedagogical educational model for Interprofessional Education (IPE) in order to acquire the skills needed for the team model healthcare (2003). For many years researchers and practitioners have understood the need to enhance the educational and clinical experience in treating all segments of society, to provide quality management, and improve access to care to underserved patients and their families (Dabed & Cauvi, 1998; Gadbury-Amyot et al., 2006). Recently, Isiekwe et al. (2016) published a study that assessed the craniofacial education of orthodontic residents. It showed that most of the residents had limited clinical experience in the management of CLP/CFA patients. Several studies recommended that residents be exposed to a multidisciplinary team approach for CLP/CFA patients' care, both academically and practically (Ranalli et al., 1984). Noble et al. (2012), reported that the extended period of treatment for CLP/CFA patients could restrict the educational fulfillment of postgraduate students during their limited period of study. They also reported that 56% of postgraduate students indicated an intention not to treat CLP/CFA patients because they felt unsure and had limited experience" (Noble et al., 2012).

Another study showed that 28,2% of postgraduates were less confident in treating patients with CFA (Brown & Inglehart, 2009). Researchers advocated that more clinicians should become involved in the treatment of patients with CLP (Berkowitz, 2010). Not only is education essential, but its combination with research is vital to monitor and improve treatment outcomes (Spriestersbach et al 1973, vallino et al 1992, Keim & Sinclair, 2002). A research practitioner is a significant multidisciplinary member in treating and laying the foundation for continued progress in the management of complex CFA patients (McCarthy, 2009). The value of treatment management relies on the teaching and exposure received at the beginning and throughout the practitioner's career (McDonald et al., 2000). Therefore, continuous assessment of education and services of CLP/CFA is necessary to provide a foundation for improvement and to attract the attention of educational institutes for such needs. In order to discover the educational needs and expertise available, it is necessary to collect the information that maps the services, locates

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4.1.2.4 Figures and tables

FIGURE 1: Respondent distribution according to province

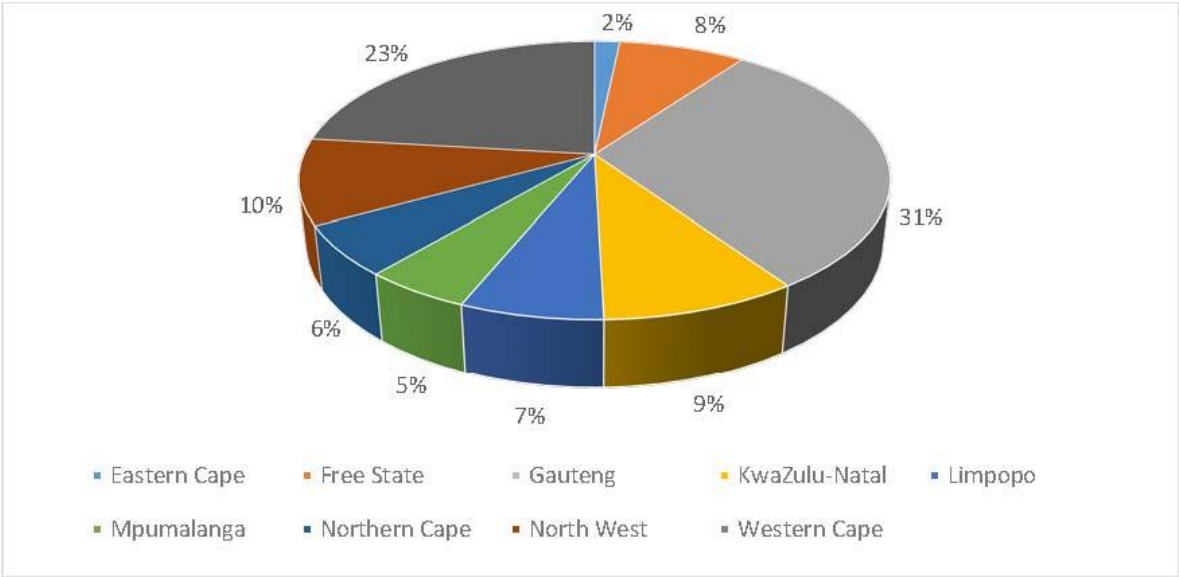


FIGURE 2: Respondent distribution according to clinical experience

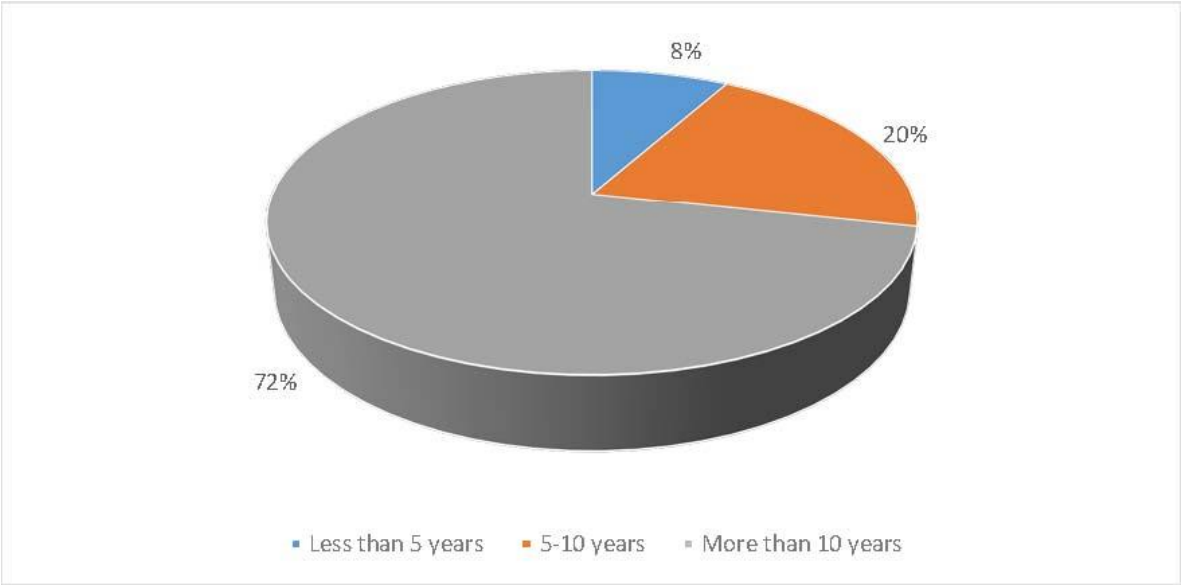


FIGURE 3: Undergraduate and postgraduate academic education in CLP/CFD patient management

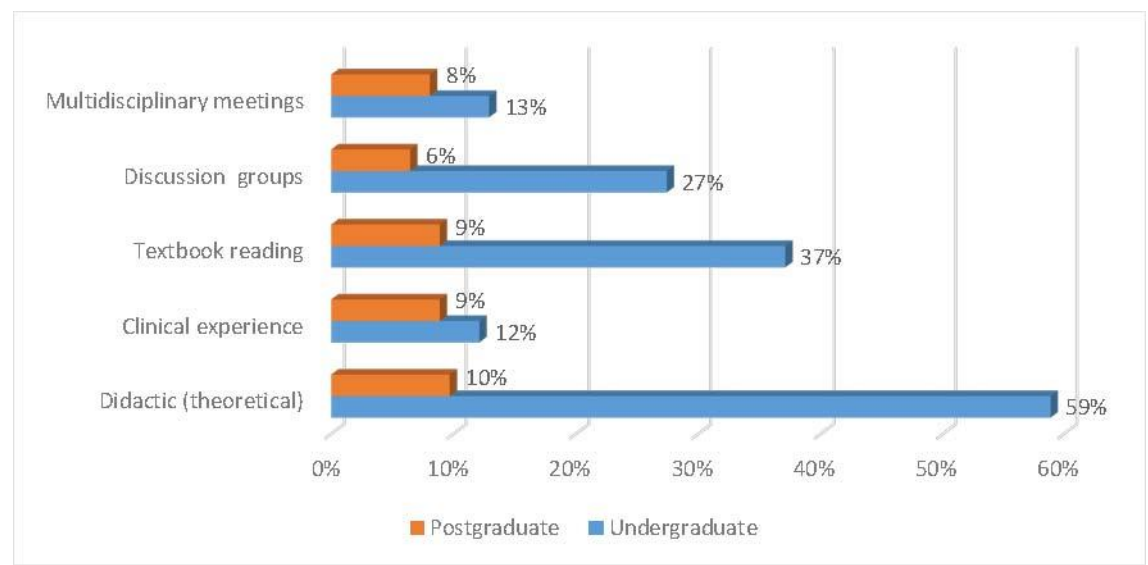
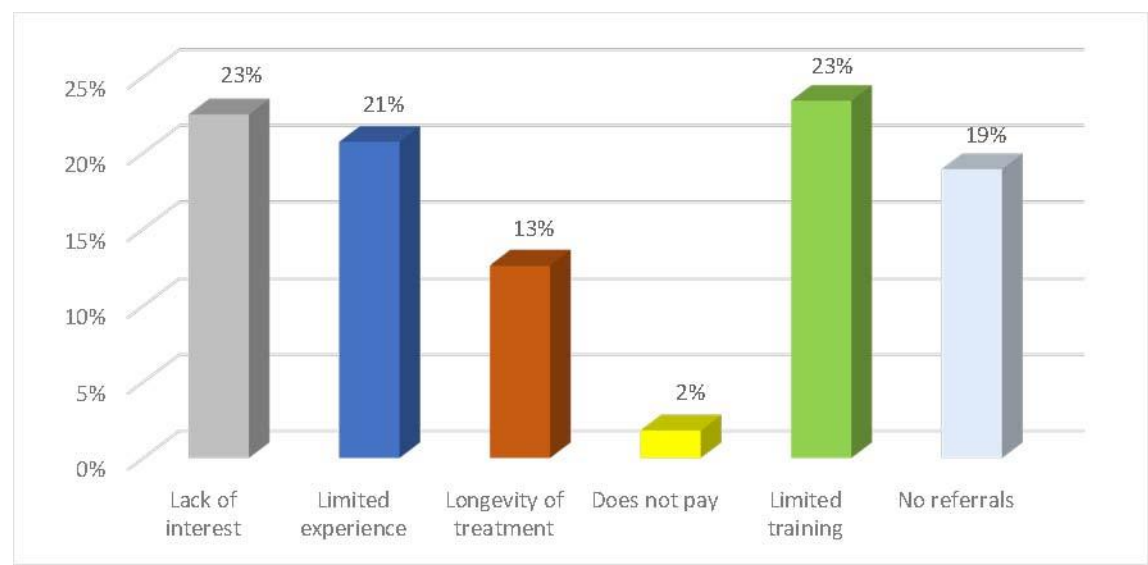


FIGURE 4: What prevents SLT from treating CLP/CFD patients



4.1.3 MANUSCRIPT 3: Perceptions of South African plastic surgeons regarding academic education

4.1.3.1 Introduction

This manuscript has been submitted for publication in the South African Medical Journal with reference number SAMJ 14620/2020. It describes the views and experiences of plastic surgeons' academic education and services related to cleft lip/palate and craniofacial deformities.

The manuscript addressed objectives 1 and 2 of the study, which were to determine the need for clinical training and the essential role it plays in enhancing clinical training of health professionals, to form a foundation on which this study is based, linking it to the main aim of the study.

The main findings of the study were that the participants in the study identified a lack in their exposure to and training in the CLP/CFD field. However, they believe that sub-speciality education and training would address their challenges and enable them to provide adequate care for CLP/CFD patients.

4.1.3.2 Perceptions of South African plastic surgeons regarding academic education in the field of facial cleft and craniofacial anomalies

E. Ghabrial

Abstract

Background

Historically South African plastic surgeons (PS) have been heavily involved in the management of facial clefts and craniofacial anomalies (FC/CA).^[1] Higher numbers of PS are leading FC/CA teams and services worldwide, where there is a need.^[2] The complex and lengthy nature of FC/CA management requires holistic services and collaboration among different disciplines.^[3] Consequently, it is increasingly important that the academic education available to PS provides in-depth knowledge, interdisciplinary participation, and adequate clinical exposure to field experts.

Objectives

This study aimed to investigate the exposure and knowledge of South African PS regarding the management of FC/CA. A second objective was to obtain an opinion from practising PS about the academic educational needs of those working with FC/CA patients.

Methods

An online survey and telephone interviews (using a structured questionnaire) was used to investigate the opinions of PS in FC/CA to determine their satisfaction with their academic education and their perceived needs.

Results

The questionnaire was completed by 41% of practising PS on the Medpages health-care provider database. Most of the respondents (63,3%) are between 30 and 49 years of age. Of the respondents, 74% showed a good general knowledge of FC/CA. However, 76,5% acknowledged that they had received only limited clinical training and exposure in this field, preventing them from providing adequate services to FC/CA patients. Only 41% of the respondents offered primary and secondary treatment to both CF and CA patients, and 40% of them had participated in interdisciplinary teams. All the respondents agreed on the need for a dedicated training programme(s) in FC/CA management, and the majority recommended sub-speciality training, through either a clinical certification or a degree course.

Conclusion

This study demonstrates that postgraduate academic training and clinical exposure of PS are limited in the FC/CA field. All the respondents agreed that an educational strategy to meet the needs of PS providing FC/CA care needs to be established. Participants suggested that part-time clinical and degree courses are needed to help them provide adequate care for CLP/CFD patients.

Keywords: plastic surgeon, cleft, facial anomalies, interdisciplinary, education, survey

Introduction

Surgical care for facial clefts and craniofacial anomalies (FC/CA) contributes to the global cost of disease, making many patients unable to access adequate surgical care.^[4] A shortage of human resources for surgical care, and inadequate surgical capacity and finance in developing countries (including South Africa), have been reported in the literature.^[5] Craniofacial surgery is identified as one of the necessary surgeries that need to be performed consistently around the world.^[6] Plastic surgery has evolved to contribute to many complex areas previously managed by other

specialities like FC/CA^[7] as stated by Rocha et al.^[8] Medical professionals prefer that PS manage such anomalies. One of plastic surgery's greatest innovators, Paul Tessier, described the technique for craniofacial reconstruction that changed the face of plastic surgery. Since then, a new sub-speciality of craniofacial surgery developed.^[9] Subsequently, PS played a significant role in caring for children born with FC/CA.^[10] To provide adequate care, these surgeons need the training to manage both hard and soft tissue conditions in order to achieve optimal functionality and an aesthetically balanced and symmetrical result.^[11-12]

The earliest attempt to assess the exposure of medical and dental students to FC treatment was done using a survey questionnaire.^[13] The main finding was that students lacked clinical exposure and basic theoretical education. Spriestersbach et al.^[14] acknowledge the effects of limited training in FC/CA management and advise that a clinician with limited training should not manage individuals with FC/CA.

The nature of these anomalies, which are not singular or consistent entities, combined with other challenging health issues,^[15] makes it more difficult to handle such patients because a single discipline cannot make all treatment decisions.^[16] Close collaboration among different disciplines is an integral part of the interdisciplinary team approach to the management of patients and advocated by practitioners.^[17] Therefore, practitioners involved in FC/CA should be educated not only in their field but also in the treatment provided by other disciplines involved in interdisciplinary care.^[18] As a result, the training and development of an efficient interdisciplinary team member should be based on a pedagogical model for successful skills transfer and cooperation within the team model.^[19] Not only is academic education essential for an interdisciplinary team member, but it must be combined with research in order to monitor and improve treatment outcomes.^[20]

The value of treatment management relies on the training and exposure the student receives at university and the knowledge gained throughout the practitioner's career. Therefore, feedback on the education received and further training needs is necessary to provide a foundation for the improvement of educational courses, which will lead to the provision of better health services.^[21]

Objectives

- Measure the academic exposure and training satisfaction of PS in the management of FC/CA.
- Obtain opinions from PS about the adequacy of academic education and needs in FC/CA care.

Methods

Ethical permission was obtained from the Humanities and Social Sciences Research Ethics Committee (HSSREC) of the University of KwaZulu-Natal. The research survey was completed by South African PS, who consented to participate in the study, using an online questionnaire to investigate the academic education provided on FC/CA care. A quantitative research method, using a 51-item structured questionnaire, was developed. Qualtrics Research Suite survey software was used to capture and analyse the data. The questionnaire was designed to collect quantitative data using a Likert-type scale, which was explained telephonically to each practitioner. Consent for participation was obtained from each respondent before completing the questionnaire. The data was collected either online or during a telephone interview, according to the preference of the participant.

Questionnaire design

The questionnaire consisted of a statement of consent to participate, followed by four sections: the first determined whether the participants were acceptable for inclusion in the study. The second section collected their level of knowledge and experience. In the third section, their needs and preferences regarding further education were determined. The final section collected demographic data, which included title, gender, age, degree(s), and location by region.

Selection of participants

A random sample of PS was obtained from the Medpages active practitioners' database.^[22] The sample was randomly selected from the list using Microsoft Excel (2013). On the advice of a statistician, the number of participants was selected representing PS in South Africa, with a sampling error of approximately 15%.

Before distribution, the questionnaire was piloted by a conveniently selected sample of practitioners. They were invited to complete the questionnaire, which was subsequently revised based on their responses in order to ensure the appropriate capturing of data. The researcher then approached the South African Society of Plastic Surgeons to distribute the survey by email. Initially, the questionnaires were to be distributed by the Qualtrics online survey platform twice during the first week, then weekly afterwards. This proved to be unnecessary, as the targeted participant number was achieved by randomly contacting 60 PS on the Medpages database.

Data analysis

The data captured using Excel 2013 was converted into Stata 15 s (string) format. The analysis undertaken was descriptive summary statistics presenting frequencies and associated percentages. No further analytical tools were used because no hypothesis was being tested.

Results

The questionnaire was completed by 41% of the PS listed in the Medpages database, representing most South African provinces, with the highest participation from Gauteng (30,5%), the Western Cape (28,8%), KwaZulu-Natal (15,2%) and the Eastern Cape (3,3%) (Fig. 1). The distribution of participants according to age showed that 63,3% were aged between 30 and 49 years, 33,3% between 50 and 65 years, and the rest were older than 65 (Fig. 2). When asked general questions about the incidence and distribution of FC/CA, only 74% showed good general knowledge. Regarding FC/CA academic education, 23,3% of the participants noted that during their postgraduate studies, they had received some clinical exposure and participated in FC/CA interdisciplinary meetings and discussions. A total of 25% gained their knowledge from textbooks and received their information using lectures (didactic input) (Fig. 3).

Regarding services to FC/CA patients, 59% of the professionals did not offer surgical treatment for either group. When asked to name the factors that prevented them from treating FC/CA patients, 16,6% acknowledged that it was due to their limited clinical experience and training, 33,3% mentioned the long duration of the treatment, 7,5% cited lack of interest, and 12,5% mentioned limited access to interdisciplinary care. A few mentioned that they received very few referrals (Fig. 4). All the respondents agreed on the need for dedicated academic training programmes for FC/CA management. Of the respondents, 39,6% proposed a non-degree clinical fellowship, while 21,5% suggested degree courses, and the rest recommended continuing professional education (Table 1). For degree and non-degree clinical fellowship courses, the respondents suggested that admission requirements should include at least one professional degree. A total of 96,6% said that registration as a health professional was essential, whereas 51,6% emphasised years of clinical experience, and 5% suggested writing an admission examination (Fig 5). When the participants were asked about their motives for enrolling in such a programme, 21,9% identified interest and passion, 17,5% liked the idea of joining an interdisciplinary team, 14,9% mentioned alleviating community needs, 10,5% wanted to receive a degree, and only 9,6% wished to improve their income (Fig. 6). The participants had various views on the essential aspects of the training programme(s), but the majority agreed that discussions, lectures, and keeping a logbook are essential. Assignments were valued by 71,6%, whereas 66,6% recommended clinical research (Table 2). Regarding the form of evaluation,

79,6% recommended keeping a logbook of clinical hours, 68,9% suggested a written/oral examination, 60,3% suggested assignments, and 36,2% proposed publication in a scientific journal as a vital evaluation method (Fig 7).

Discussion

To our knowledge, no survey has been undertaken in South Africa to investigate the opinion of PS about academic education in the field of FC/CA. Such surveys have, however, been conducted among other specialities in other parts of the world,^[13,23] indicating the importance of this kind of study. Other studies of health professionals used samples from the national database for professionals.^[23-24] In this investigation, participants were obtained from a list of active PS in a privately managed health-care database, Medpages, which is regularly updated to provide a true reflection of the current practising PS' views.^[25] The sample was randomly selected from the Medpages database. It included practitioners from different locations and places of employment, in order to obtain a broader sample and obtain general opinions from all clinicians.

It is recognised in the literature that it is difficult to receive adequate response rates in surveys of medical practitioners.^[26] Some researchers have used email or postal questionnaires, and others have used incentives to improve the response rate.^[27] In this investigation, the 41% response rate was achieved by using a mixed method of data collection using both telephone interviews and email. This provided not only statistically significant data but also a vast distribution not limited by email access, in line with recommendations by Flanigan et al.^[28]

In agreement with the findings of other disciplines regarding FC/CA academic education,^[29-30] this study found limited emphasis on clinical training and interdisciplinary exposure during academic graduate programmes, resulting in graduates leaving with limited education in the FC/CA field.^[31] The survey also revealed a strong desire among South African PS for professional development and the need for a dedicated educational programme(s) in FC/CA patient care.

FC/CA programmes are available in different parts of the world as a sub-speciality obtained by completing a clinical fellowship residency.^[32] However, participants in this study suggested various forms of training. A non-degree clinical fellowship was proposed by 39,6%, and 21,5% suggested degree courses. The rest recommended continuing education courses. Concerning the length of such programmes, the respondents were equally divided between one and two years, which is partially in line with the minimum 12 months of fellowship residency recommended by Silvestre et al.^[33] Similar to the current recommended structure of fellowship in different parts of the world,^[34-35] the majority of the respondents recommended that the training should place more

emphasis on discussions and clinical contact, with evaluation using formal examinations and a logbook recording clinical hours.

All the respondents indicated that training must include interdisciplinary team participation in order to produce surgeons who are capable of providing holistic and effective care for those affected with FC/CA. This agrees with recommendations in other studies.^[32] Such comprehensive training can be offered by an interdisciplinary FC/CA centre where experts in the field perform a high volume of craniofacial surgical procedures.^[36] As stated by Ergo et al.,^[35] candidate selection criteria should be a professional degree, the number of years qualified, and possibly even an admission examination. However, the respondents did not consider other requirements, such as research experience and publications in candidate selection. This is in contrast with Grewal et al.,^[37] who state that scientific publication is a good indicator of those who will be willing to provide fellowship mentoring and education. The respondents in this survey did recommend that the selected candidates must demonstrate interest and passion and should be willing to join an established craniofacial team.

Conclusions

There is a need to establish an educational strategy for PS in FC/CA surgery to ensure that they are competent and can, therefore, provide interdisciplinary services for FC/CA patients. This study revealed that many practitioners are enthusiastic and willing to enrol in training programmes to prepare them to deliver the best clinical care in FC/CA management. This investigation also provided information about candidate selection criteria, educational objectives, and evaluation of such a programme(s). Our findings show that South African PS, academicians, practitioners, and professional societies need to collaborate to maintain and develop craniofacial centres, where a high volume of FC/CA surgical procedures are performed, and enough experts are employed. All this will provide adequate training to equip candidates not only to provide ideal and comprehensive services for FC/CA patients but also to undertake initiatives in forming and leading an interdisciplinary team for FC/CA care.

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4.1.3.4 Figures and tables

FIGURE 1: Respondent distribution according to province

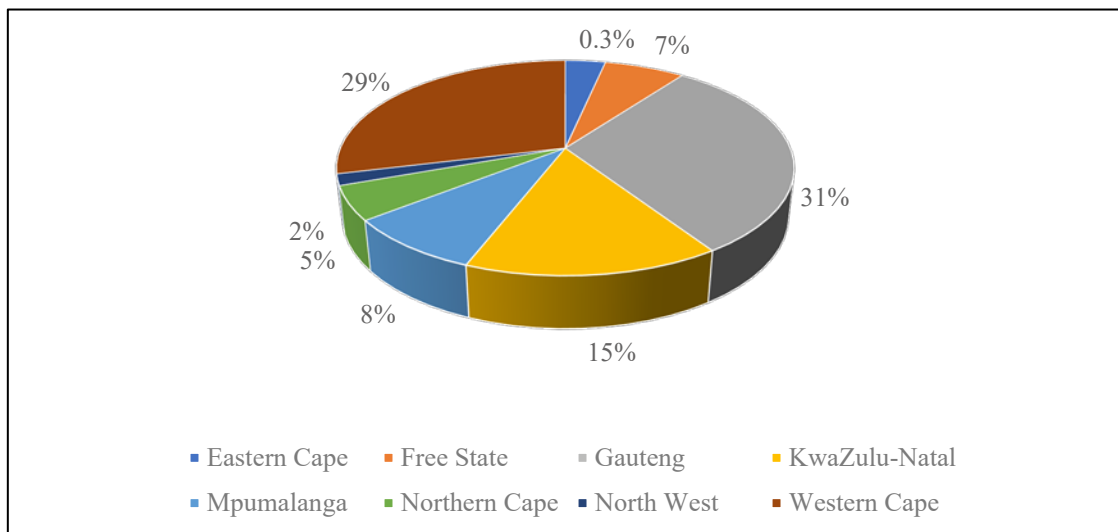


FIGURE 2: Respondent distribution according to age

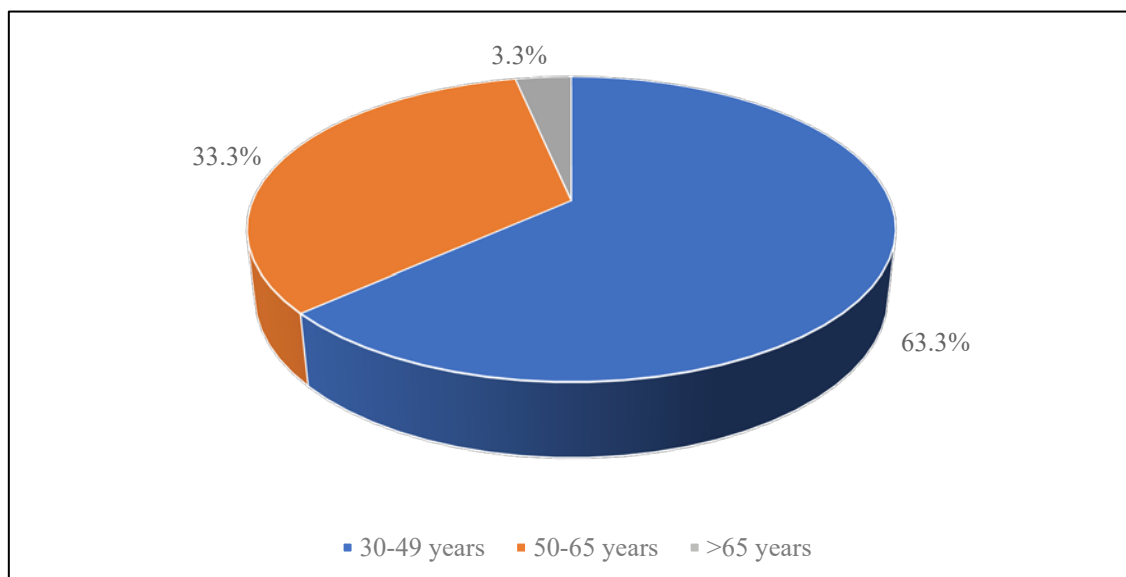


FIGURE 3: Did your postgraduate programme include any of the following in the management of FC/CA?

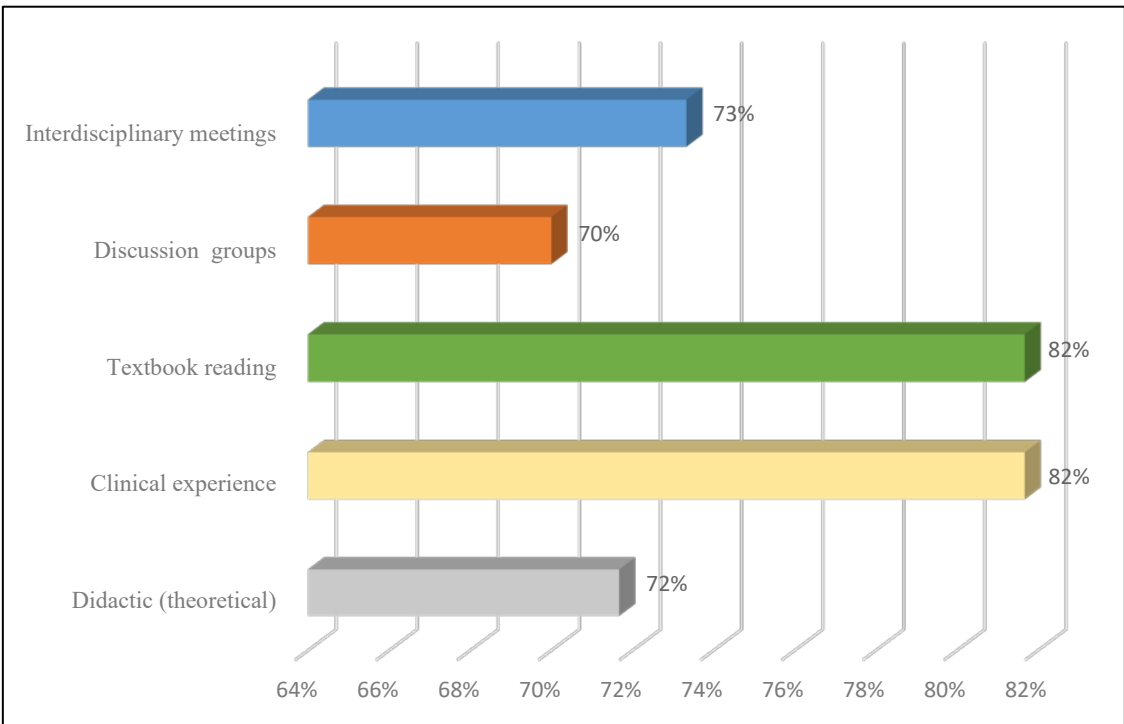
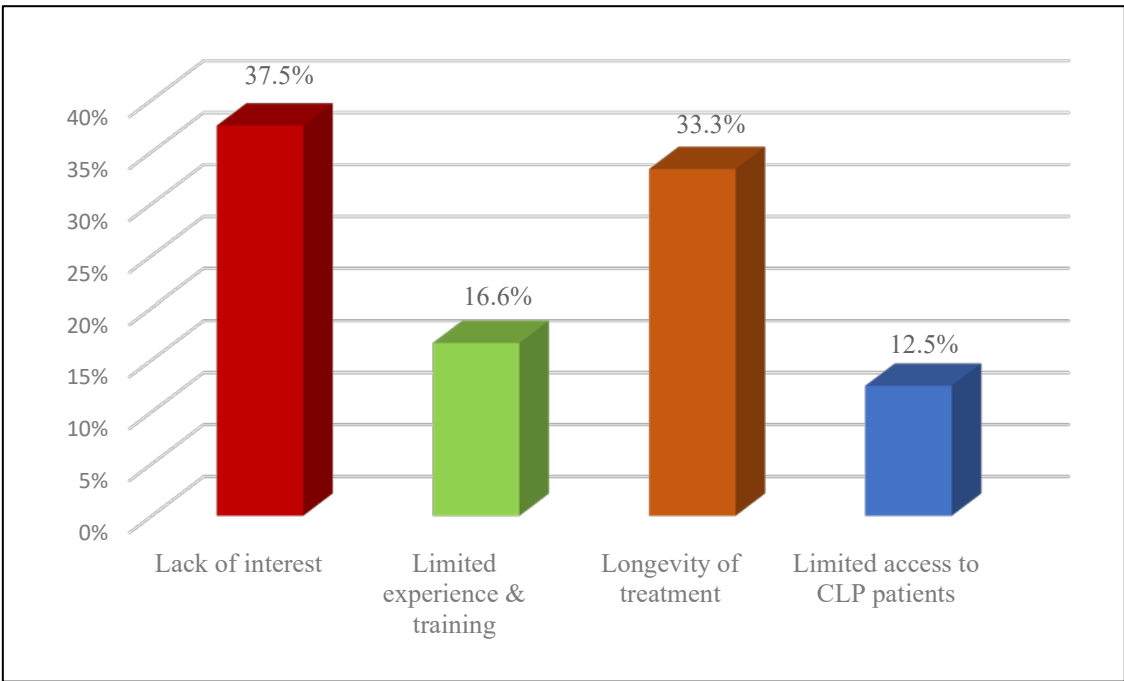


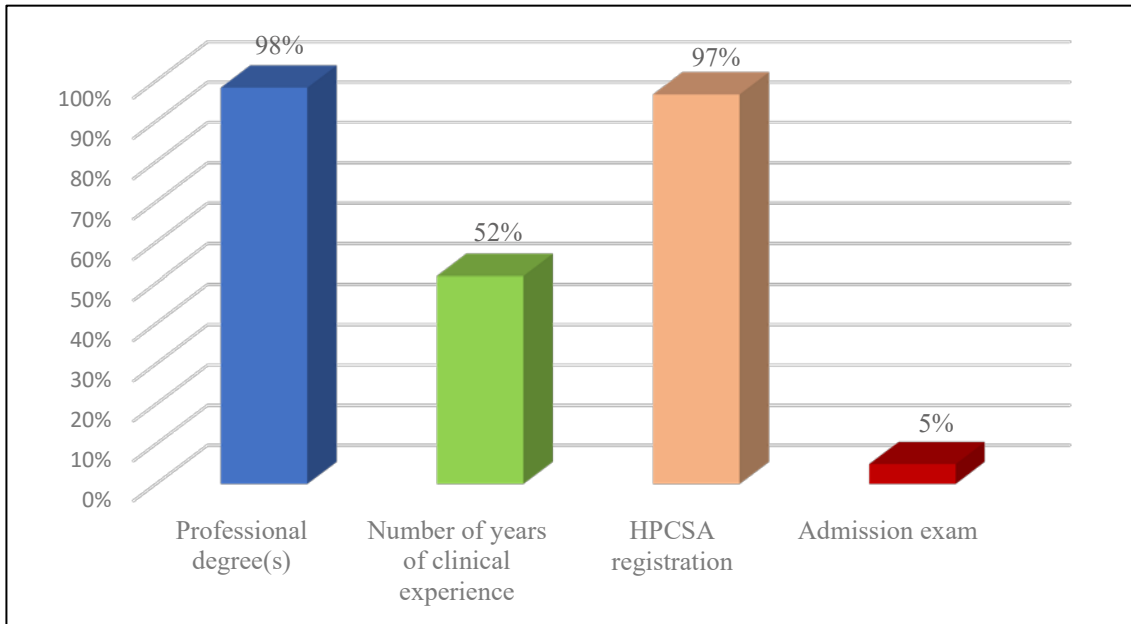
FIGURE 4: Reasons preventing PS from adequately treating FC/CA patients



MANUSCRIPT 3 - TABLE 1: Types of course recommended

Degree course, (diploma, master's and fellowship certification)	21,6%
Non-degree course and clinical fellowship training	39,7%
CPD courses	38,8%

FIGURE 5: Admission requirements



MANUSCRIPT 3 - TABLE 2: Recommended learning activities

Lectures	90,0%
Discussions	95,0%
Logbook/clinical hours form	80,0%
Clinical research	66,7%
Assignment topics	71,7%
Journal discussions	65,0%
Textbook reviews	63,3%

FIGURE 6: Motivation for enrolling in an FC/CA postgraduate course

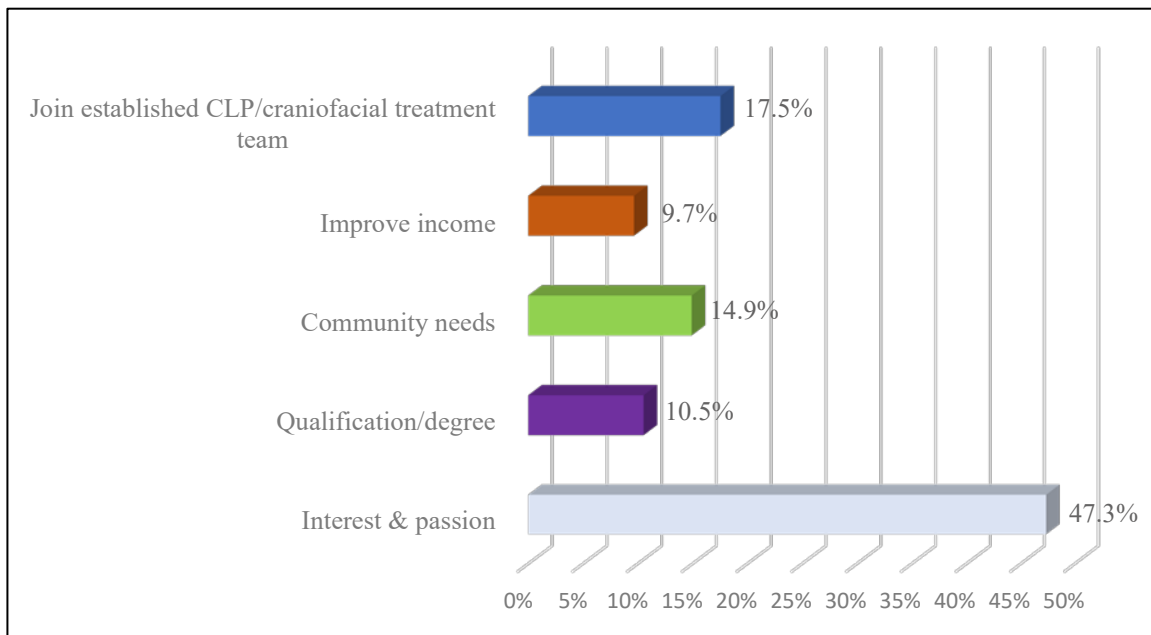
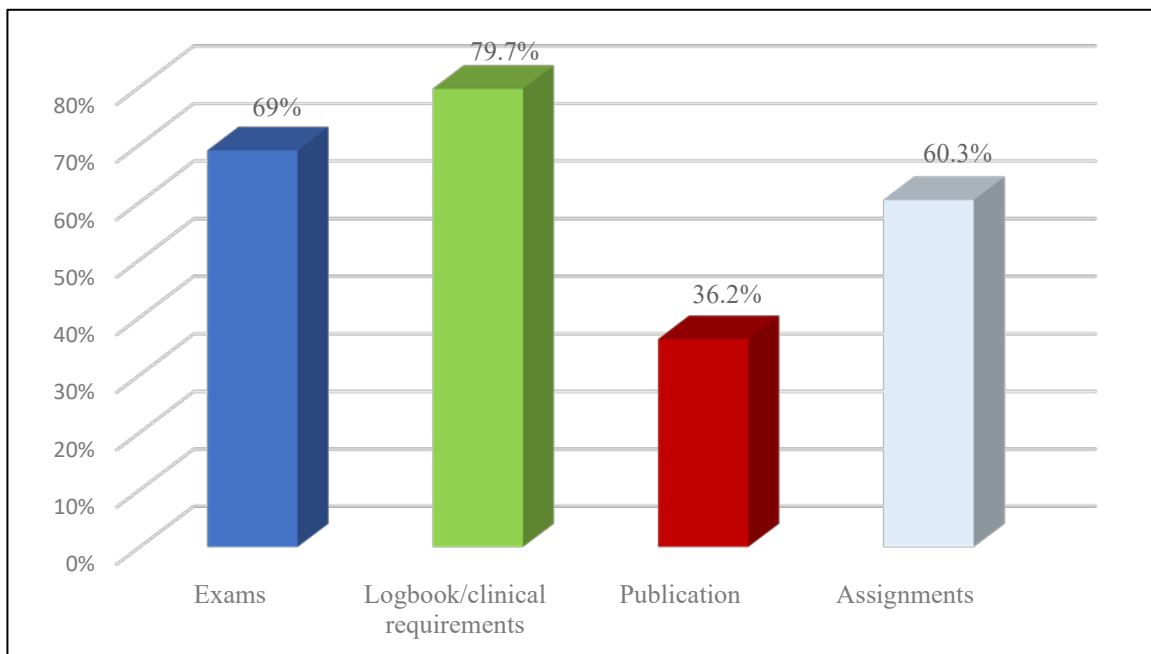


FIGURE 7: Forms of evaluation for degree(s) and non-degree fellowship courses



4.1.4 MANUSCRIPT 4: The orthodontist's views regarding academic education

4.1.4.1 Introduction

This manuscript has been submitted for publication in the South African Medical Journal with reference number MS 942/2020 SADAJ. It describes the views and experiences of orthodontists' academic education and services related to cleft lip/palate and craniofacial deformities.

The manuscript addresses objectives 1 and 2 of the study. It is to determine the need for academic training, hence forming a foundation on which this study is linking it to the main aim of establishing dedicated courses for CLP/CFD management.

The main findings of the study were that the participants in the study identified a lack in their training and exposure in the CLP/CFD field. However, they believe that dedicated courses that offer education and training are needed to meet the challenges in providing adequate care for CLP/CFD patients.

4.1.4.2 The orthodontist's views regarding academic education in cleft lip and palate as well as craniofacial deformities in South Africa

E Ghabrial, K-W Bütow

Abstract

Background

Orthodontists (Orthod) are essential members of a craniofacial team (American Cleft Palate-Craniofacial Association Team Standards Committee).¹ Because cleft lip/palate (CLP) and craniofacial deformities (CFD) vary in severity and facial growth patterns, treatment is complex and lengthy. It therefore requires collaboration among different disciplines. Consequently, orthodontists need specialised training in this field to reach the treatment goals of good facial growth, aesthetically acceptable appearance, and dental occlusion. Therefore, it becomes increasingly important to provide adequate training for orthodontists, so that they are not only able to provide efficient treatment but can also assume leadership roles in the field.

Objectives

To obtain information regarding:

- the CLP/CFD academic education of orthodontists;
- the professional services that orthodontists offer to CLP/CFD patients; and

- the educational and training needs of orthodontists in this field.

Methods

A 51-item online survey to collect quantitative data was conducted using interviews with a randomised sample of orthodontists attending their annual scientific congress of the South African Society of Orthodontics.

Results

The questionnaire was completed by 53 orthodontists, 54,5% of whom had more than 10 years of professional experience. Of the respondents, 84,7% had experienced some clinical exposure in this field during their postgraduate education. Treatment for CLP/CFD patients was offered by 92% of the professionals, but only 21,7% had high confidence in their expertise in treating CLP/CFD patients. Of the respondents, 88% agreed that there was a need to improve CLP/CFD education, and the majority recommended fellowship training and certified courses. The rest suggested continuing-education workshops.

Conclusion

Most of the orthodontists provided treatment for both CLP and CFD patients, despite some of them lacking confidence in treating such cases. The majority agreed that there is a strong need to establish an educational strategy to meet the needs of orthodontists who treat CLP/CFD patients. The respondents suggested programmes such as fellowship training, certified courses, and continuing education workshops.

Keywords: orthodontics, cleft palate, cleft lip, multidisciplinary, education, professional development, survey

Introduction

A multidisciplinary team approach for the management of patients with cleft lip/palate (CLP) and craniofacial deformities (CFD) has been advocated by practitioners.²⁻⁴ The orthodontist has become an essential member of this multidisciplinary team, according to the American Cleft Palate-Craniofacial Association team guideline.¹ Orthodontists are actively involved in the life of a patient born with a CLP/CFD from birth to skeletal maturity. This may include infant pre-surgical orthopaedics, early mixed dentition treatment, dentofacial orthodontics and preparation for alveolar bone graft procedures and pre-prosthetic and surgical orthodontics.⁴ Consequently orthodontic treatment is considered a core service in the management of CLP/CFD.⁵⁻⁶ The role of the orthodontist within the craniofacial team has been widened to include, among others, record

taking of the overall treatment plan and outcomes, participation in inter centre comparisons of treatment outcome, and implementation of a quality control system for CLP/CFD care.⁷⁻⁹

For many years, researchers and practitioners have understood the need to enhance academic education and clinical experience in CLP/CFD in order to provide quality management and improve access to care for all patients and their families.¹⁰⁻¹² One of the earliest attempts to evaluate education in the CLP field was made in 1973 by Lass et al.¹³ They assessed the exposure of students to CLP treatment using a questionnaire. Their main finding was that there was a lack of clinical exposure and basic theoretical education. The health and well-being of children with deformities depend on the clinical expertise of those who serve them and ACPA,¹⁴ Berkowitz,¹⁵ and McCarthy¹⁶ recommend further education for orthodontists in CLP/CFD to enable them to provide adequate care.

The quality of care of all patients is influenced by the adequacy of the treatment he or she receives.¹⁷ CLP/CFD patient treatment relies on the teaching and exposure that the practitioner received as a student at university and the knowledge gained throughout the practitioner's career.¹⁸ It is necessary to obtain information about the education of orthodontists in the CLP/CFD field and also to determine what training/instruction those administering the treatment need. Therefore, continuous evaluation by practitioners of the education and training of orthodontists is necessary in order to obtain their views on how to improve educational resources.¹⁹

Methods

Ethical permission was obtained from the Humanities and Social Sciences Research Ethics Committee of the University of KwaZulu-Natal. The research survey was completed by South African orthodontists using an online questionnaire to investigate their level of education and the services they provided to CLP/CFD patients. A quantitative research method using a 51-item structured questionnaire was developed. Qualtrics Research Suite survey software used to capture and analyse the data. The questionnaire designed to collect quantitative data using a Likert-type scale and was introduced to each practitioner using an interview. Consent to participate was obtained from each respondent before completing the questionnaire.

Questionnaire design

The questionnaire consisted of four sections: the first determined whether the participants could be accepted for inclusion in the study. The second section collected the level of knowledge and experience of and services provided by the participants. In the third section, their educational

needs and preferences regarding further education were determined. The last section collected demographic data, which included title, gender, age, degree(s), and location by region.

Selection of participants

Two students helped to interview a random sample of orthodontists at the annual scientific congress of the South African Society of Orthodontics. Regarding the sample size: the author used information in the academic literature as guidance. This was reviewed upward to 46,4% of the Medpages database of practising orthodontists, to account for a possible sampling error of 15%.²⁰⁻²¹

Sample distribution

The researcher received permission from the South African Society of Orthodontics to randomly interview orthodontists, using an online questionnaire, during their annual scientific congress. The questionnaire was developed and piloted by a selected sample of practitioners. It was subsequently revised based on their responses in order to ensure that data was captured appropriately.

Data analysis

The data was captured using Excel 2013, and this was later converted into Stata 15 s (string) format. The analysis undertaken was in the form of descriptive summary statistics presenting frequencies and associated percentages. No further analytical tools were used because no hypothesis was being tested.

Results

The questionnaire was completed by 53 orthodontists, representing most of South Africa's provinces (Fig. 1). Of these practitioners, 54,5% had more than 10 years of professional experience (Fig. 2). In the basic knowledge questions about CLP, 52% of the respondents were uncertain of the correct answers. When asked about their educational experience, 84,7% stated that they had clinical exposure during their postgraduate education, and 72,8% had participated in multidisciplinary meetings in the course of their degree. A total of 89,8% gained their knowledge from textbooks and received their information using lectures (didactic input) (Fig. 3). Even though 92% of the respondents offered treatment to both CLP and CFD patients, only 30,4% of them participated in multidisciplinary teams. Regarding the services provided according to a patient's age group, 35,7% offered orthodontic treatment for patients between 11 and 18 years, and 28,2% offered services for those between 7 and 10 years. Only 10,2% offered services to

infants and children between the ages of four and six. When the respondents were asked about the facility where CLP patients were consulted and treated, the following data emerged: private practice (38,3%), academic hospitals (33,3%), and government hospitals (19,7%). Only three of the respondents offered their services at charity organisations.

When the respondents were asked to indicate on a scale of 1 to 10 how confident they were in treating CLP/CFD patients, 50% admitted having low confidence, 28,3% were moderately confident, and only 21,7% stated that they were highly confident in treating CLP/CFD patients (Fig. 4). They also acknowledged that CLP/CFD treatment is challenging and requires special training. They indicated that special training was needed for a multidisciplinary approach (37%), the lengthy treatment (30,4%), and patients' socio-economic situation (28,5%). In the open-ended questions, a few respondents cited the emotional issues and poor oral hygiene added to the treatment challenges.

Almost all the respondents agreed on the need to improve the academic education offered to CLP/CFD orthodontic care providers, and 91,3% recommended dedicated academic training programmes in that field. Of the respondents, 50% would like to further their knowledge, 27,5% were unsure, and the rest said that they needed no additional training. When participants were asked about the preferred method of education, the majority (41%) recommended fellowship training, 30,8 % recommended short courses, 26,9% recommended degree/certification courses, and only 1,3% considered that participation in a multidisciplinary clinic is sufficient to gain the required knowledge (Table 1).

Participants identified interest, passion, and the prospect of joining a multidisciplinary team as the most significant reasons for enrolment in CLP- and CFD-dedicated courses. When asked about the goals and objectives of the educational programme(s), the participants suggested that the focus should be on diagnosis, treatment planning, clinical skills, and a multidisciplinary approach. Of the respondents, 67% recommended keeping a logbook of the cases treated in clinical training, as well as preparing assignments. A total of 46,5% suggested participating in examinations, and 19,3% proposed published articles as effective evaluation for certificate courses (Fig. 5).

Discussion

This study is important in that research has never been done into the extent of orthodontists' training in CLP/CFD care in South Africa. Academic education and training of practitioners can determine access to adequate care for patients with CLP/CFD.

A series of surveys of orthodontics education programmes were undertaken, but these only focused on students.²²⁻²³ In the current study, attention was given to information obtained from practising orthodontists with varying years of experience, from different locations and places of employment, in order to overcome limitations and to obtain general opinions from a representative group of clinicians.

In line with Nobel et al.,²⁴ most of the participants of this study had formal training in the treatment of patients with CLP/CFD. Despite this, respondents expressed the need for further training and clinical exposure to make them better prepared to provide services to such patients.

A number of previous academic educational surveys²⁵ used email or postal questionnaires, with some using incentives to improve the response rate.²⁶ This study achieved a 46,4% response rate using interviews with attendees at their annual scientific congress,²⁷ which is a statistically valid amount.²⁸

This study found that participants had adequate CLP/CFD theoretical education, as well as some clinical exposure during their postgraduate programme that prepared them to offer treatment to CLP/CFD patients. This contrasts with Pannbacker et al.,²⁹ who found that practitioners who are legally qualified to provide treatment know very little about these deformities.

This investigation revealed a desire on the part of orthodontists for developmental and dedicated educational programmes in managing patients born with CLP/CFD, in line with the findings of Noble et al.²⁴ Of the respondents, 41% recommended a fellowship (matching the current trend in different parts of the world).¹⁶ The majority of the respondents recommended that the training should place more emphasis on discussions and clinical contact, with evaluation using formal examinations and a logbook recording clinical hours. This could be linked to a clinical fellowship programme in line with the standards set by the American Dental Association for accredited fellowship programmes.³⁰

As stated by Schoenbrunner et al.,³¹ comprehensive CLP/CFD training can only be offered by a multidisciplinary affiliated centre, where specialists in the field perform a high volume of

craniofacial procedures. Furthermore, centres that offer craniofacial orthodontics, and surgery fellowships have shown the strongest relationship with the success of CLP/CFD centres.³²

Regarding candidate selection, the respondents suggested that criteria should include a professional degree(s), the number of years qualified, and possibly an admission examination. However, the respondents did not consider other requirements, such as research experience and publications, to be significant in candidate selection. This is in contrast with the findings of Grewal et al.,³³ that candidates, published in a scientific journal, are a good indicator of those who would be willing to provide fellowship mentoring and education. The respondents recommended research input as a part of the course objective and the evaluation of all candidates.

Conclusion

As the orthodontists' field expands, there is less training in uncommon problems like CLP/CFD during their postgraduate education. Orthodontists may be confronted with the need to provide services that they are not highly confident in performing. It is, therefore, essential for orthodontists to have advanced training to reach proficiency in providing CLP/CFD care. This study shows a demand from the participants for advanced education and training in the CLP/CFD fields, and a desire for academic institutions to adopt educational strategies and provide sub-speciality courses like craniofacial fellowships. Such training can provide orthodontists with the knowledge and confidence to provide correct care to CLP/CFD patients and to play a fundamental role in multidisciplinary teams by investigating treatment outcomes and implementing quality control measures.

Limitations

This survey represents the opinions of those orthodontists attending their annual scientific congress in September 2017 who were randomly selected and willing to be interviewed. Those orthodontists who did not participate in the study may have different views.

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4.1.4.4 Figures and tables

FIGURE 1: Respondent distribution according to provinces

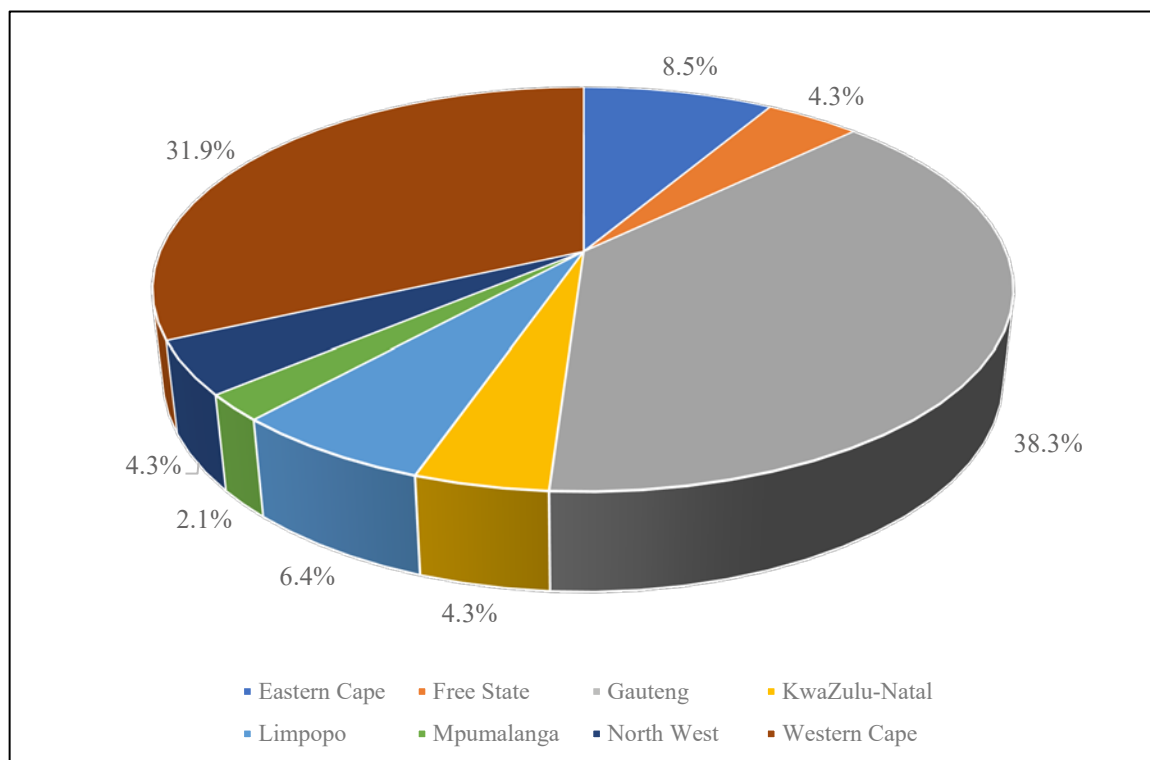


FIGURE 2: Respondent distribution according to clinical experience

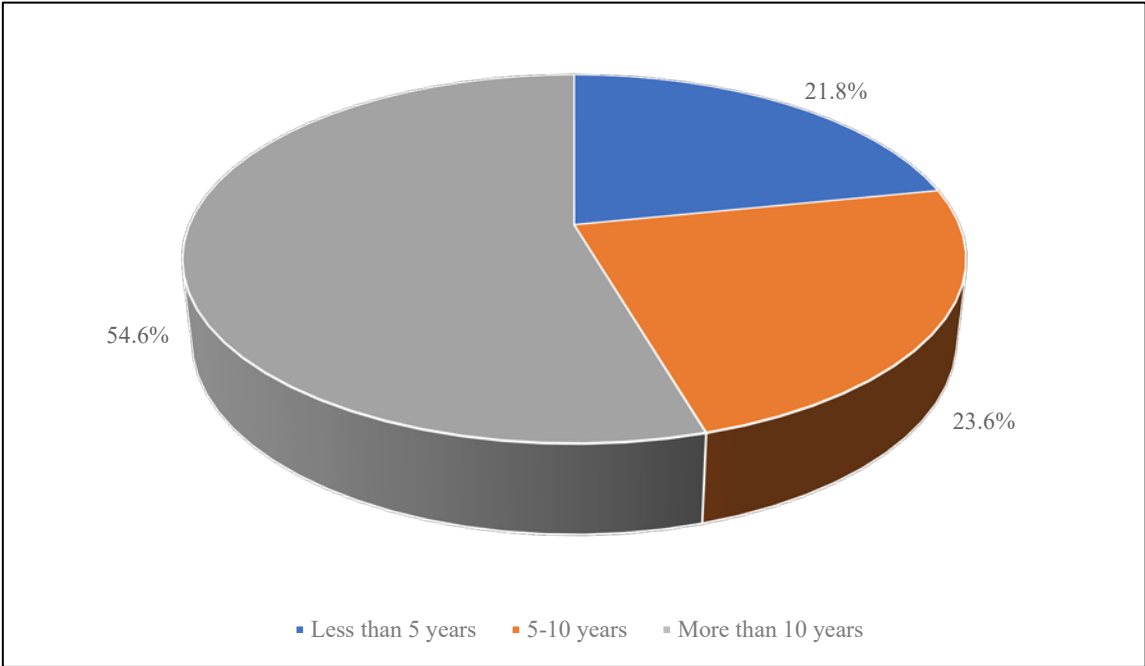


FIGURE 3: Did your postgraduate programme in CLP/CFD include the following learning opportunities?

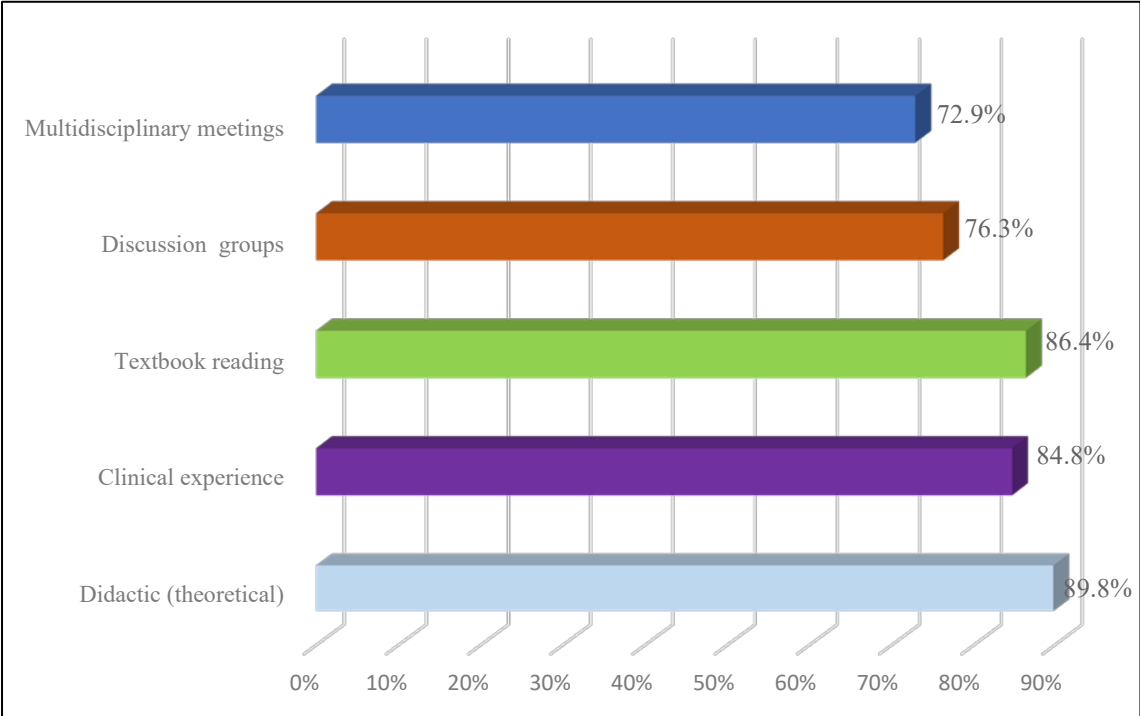
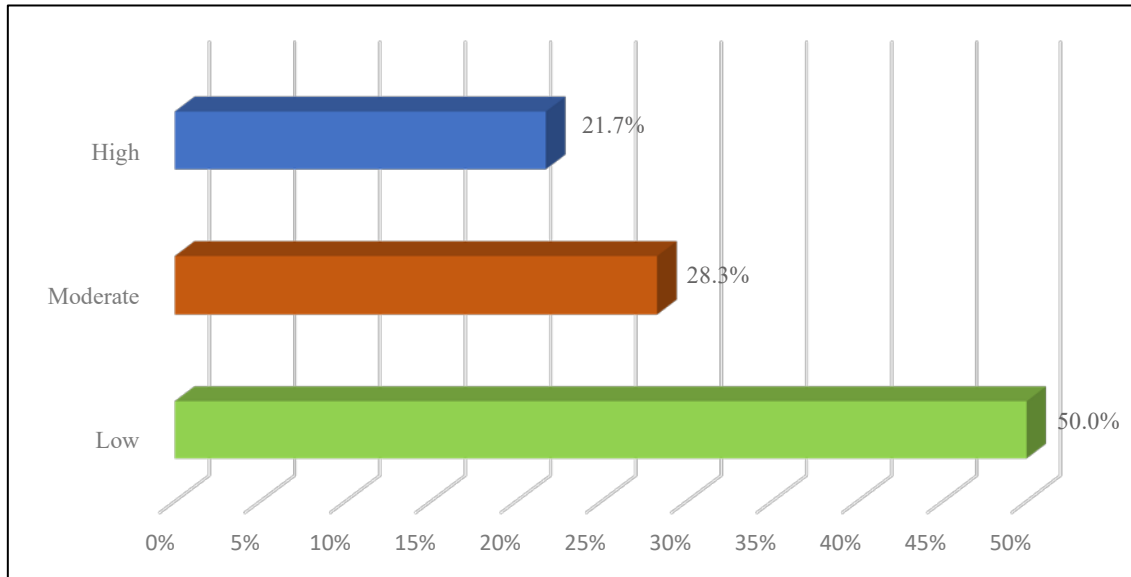


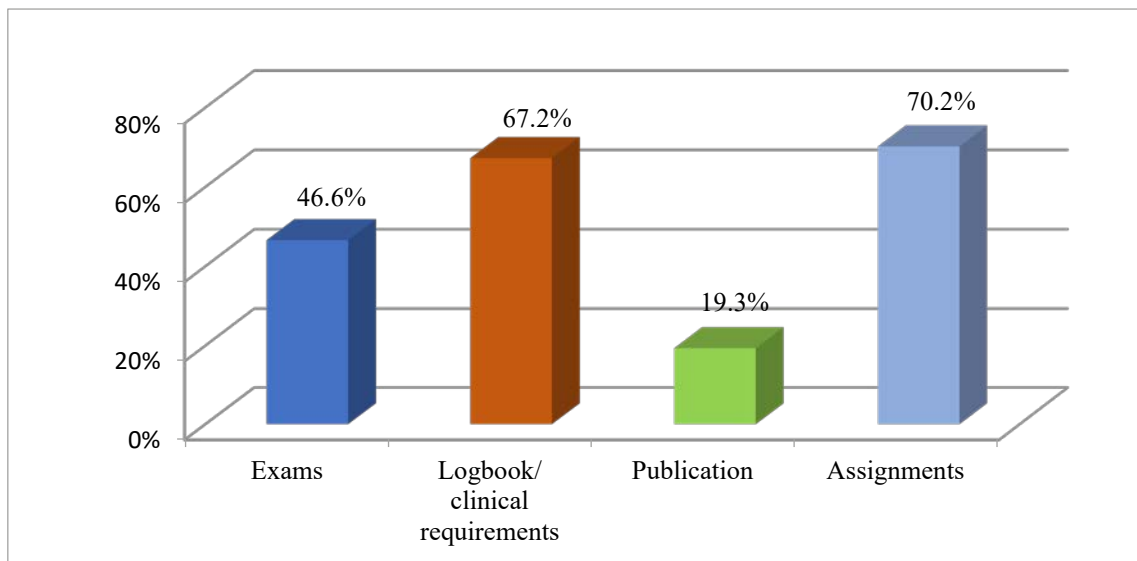
FIGURE 4: How confident are you in treating and managing CLP/CFD patients?



MANUSCRIPT 4 - TABLE 1: Type of course recommended (percentages)

Fellowship training	41.0
Degree course	26.9
CPD courses	30.8
Voluntary participation in a multidisciplinary team	1.3

FIGURE 5: Forms of evaluation for degree(s) and non-degree fellowship courses



CHAPTER 5

5.1 SYNTHESIS AND RECOMMENDATIONS

5.1.1 Synthesis

5.1.1.1 Introduction

This study is unique in collecting the opinions of the four core disciplines involved in the multidisciplinary team of CLP/CFA management, namely orthodontists, speech-language therapists, maxillofacial and oral surgeons, and plastic surgeons. Most of the participants from the different disciplines agreed that the management of CLP/CFA patients is complex and that it needs a multidisciplinary approach, and specialised training.

Sample

The Medpages health-care provider database gatekeeper was used to obtain permission to utilise the contact details of the professionals for the study. The respondents were spread over all the South African provinces. The response rate achieved was 46,3% for MFOS, 41% for PS, 46,5% for Orthod, and 18,83% for SLT. The study was introduced to the participants by a telephone call giving them a choice to do a telephone interview (recording their responses) or by sending them the online questionnaire by email. However, for orthodontists, the data collected was performed during their annual orthodontics scientific congress.

Treatment and intervention

Although 42,6% of MFOS, 92% of Orthod, 41,6% of PS and 42,7% of SLT provide treatment and intervention for CLP/CFA patients, only a few have high confidence in providing such services (MFOS 5,5%, Orthod 17%, PS 10% and SLT only 1,6%). Low confidence shows that professionals are facing and treating patients beyond their competency, which could result in poor outcomes and services.

5.1.1.2 Education

All disciplines had some academic education in CLP/CFA fields, but many still felt that they could not adequately treat those patients due to limited training and experience. This feeling was echoed by MFOS (59%), Orthod (18,8%), PS (13,5%); and SLT (39,8%). Most of the respondents recommended a dedicated academic training programme(s) in that field. The preferred methods of education were degree courses and fellowship training, as expressed by MFOS (78,9%), Orthod (69,9%), and PS (61,3%). In contrast, 66,8% of SLT preferred short

courses and workshops, while 21,3% recommended fellowship training and 10,7% preferred degree and sub-speciality certification courses.

Participants across the disciplines identified interest, passion, and the prospect of joining a multidisciplinary team as the most significant reasons for enrolment in CLP/CFA-dedicated courses. When asked about the goals and objectives of the educational programme(s), the participants suggested that the focus should be on diagnosis, treatment planning, clinical skills, and a multidisciplinary approach. Regarding the evaluation methods, MFOS (88,9%), Orthod, (67%), PS (80%), and SLT (58,8%) recommended keeping a logbook of the cases treated in clinical training, as well as preparing assignments. A total of 79,6% of MFOS, 46,6% of Orthod, 69% of PS and 36,2% of SLT suggested participating in examinations for degree and sub-speciality certification. Regarding the requirement of a publication, this was recommended by MFOS (44,4%), Orthod (49%), PS (58,3%), and SLT (38,7%).

5.1.1.3 Lesson(s) from the existing education of all surgeons

Surgeons are performing critical procedures in CLP/CFA patient care. Therefore, the multidisciplinary teams are usually headed by a surgeon. Due to their essential role, they are expected to perform with sufficient practical experience and specialised training. The current educational model for surgeons in South Africa was developed in conjunction with the Colleges of Medicine of South Africa (CMSA) in 1955, which was established as an examination body to oversee standards of training. The Colleges are primarily a professional examining body and indirectly oversee postgraduate training, which must be accredited by the Health Professions Council of South Africa (HPCSA). General surgeons may choose to spend a further two years training in sub-speciality licensed units. The sub-speciality certificate training requires a minimum of two years and ends with an examination conducted under the auspices of the College of Surgeons of the CMSA and organised by the appropriate specialist society. When the candidates qualify, their sub-speciality is then registered with the HPCSA. This model is already in place, and it may be possible to extend it to the CLP/CFA field by introducing a surgeon's (MFOS, Orthod and PS) sub-speciality certification programme under the auspices of the CMSA.

5.1.1.4 Comprehensive Online Education Services (COES) for orthodontists and speech-language therapists.

The educational needs and preferences of Orthod and SLT in this study varied from continuing education courses to workshops with an emphasis on multidisciplinary exposure, in contrast to the respondents who suggested clinical fellowships and degree courses or sub-speciality

certification. Further investigation is needed to determine how to develop such courses as there is currently no sub-speciality certificate in these two disciplines in South Africa. However, a solution is to provide a hybrid model of online education using Comprehensive Online Education Services (COES) as advocated by experts in the field (Berkowitz, 2010). Students who graduate will have a fully-fledged accredited academic qualification, similar to any other graduate. This model creates a possibility to develop an online postgraduate diploma (PGDip) in CLP for SLT and Orthod, which will provide many advantages to universities, academics, and students such as the following:

- a. No strain on the current facilities and physical environment, while at the same time, the university will be able to respond positively to the growing need for access. However, a university may choose to implement an additional degree such as Master's of Philosophy (MPhil).
- b. International visibility because this mode of delivery will open the borders of the country for international students.
- c. Online education that provides opportunities for a scholarship of teaching and other research activities.
- d. Reducing the burden on lecturer teaching, research, and multiple other responsibilities.
- e. Offering a fully-fledged, pedagogically sound online module.
- f. Offering highly needed time flexibility for practitioners.
- g. International students, and anyone who is discouraged by the geographical distance between themselves and the University, being able to obtain a qualification.

This study revealed that many practitioners are enthusiastic and willing to enrol in training programmes to prepare them to deliver the best clinical care in CLP/CFA management. The participants provided information about candidate selection criteria, educational objectives, and evaluation of such a programme(s).

The study findings are that, in order to be able to offer such educational programme(s) in South Africa, academicians, practitioners and professional societies need to collaborate in order to maintain and develop multidisciplinary craniofacial centres where a high volume of CLP/CFA patients are registered and where enough experts are available. All this will provide sufficient training for the candidate not only to be able to provide ideal and comprehensive services for CLP/CFA patients but also to assume a leadership position in a multidisciplinary team and produce institutional capacity to lead future CLP/CFA care and training.

5.1.2 The study recommendations

The four disciplines agreed in this study that training should be more structured and need to be undertaken at high-volume multidisciplinary centres where all aspects of CLP/CFA can be experienced. There is an urgent need by professionals for a dedicated programme(s) in the CLP/CFA field in order to prepare them to provide competent professional treatment and to be part of the multidisciplinary care for cleft lip/palate, and craniofacial patients care in South Africa.

Building capacity in the CLP/CFA field will ensure further education, research and ensure the clinical standards of treatment outcomes (Mildinhal, 2001). Collaboration among academics, practitioners, and professional societies is essential to maintain and develop craniofacial centres. Education depends on centres where a high volume of CLP/CFA surgical procedures are performed and where enough experts are employed. This will ensure adequate training for the candidate not only to be able to provide ideal and comprehensive care but also to learn to lead in order to sustain and further develop such services.

5.1.1.5.1 Recommendations for health-care professionals (HCP)

Background: Nearly all the professionals of the different disciplines who participated in this study felt that their training could improve, and a few of them are enthusiastic about being able to advance their skills to a higher level of proficiency in the CLP/CFA fields.

From this study, the author recommends the following for health-care professionals interested in the CLP/CFA field:

- a. Individuals who are interested and passionate about the CLP field need to broaden their knowledge and training, which includes the following:
 - i. Enrolling in an international fellowship training (Meara, 2015)
 - ii. Visiting local and international multidisciplinary teams, enrolling in visiting scholar programmes provided by the ACPA
 - iii. Initiating or being a part of CLP/CFA research
 - iv. Joining or establishing a multidisciplinary team
- b. Provide parent support and education
- c. Use online educational resources, for example, ACPA-provided webinars and online community for exchanging knowledge between professionals of different disciplines
- d. Do what is best for the patient if the operator does not have adequate skills, knowledge, experience (Jerrold, 2012)

5.1.1.5.2 Recommendations for health authorities and stakeholders

Introduction

South African public health funding shifted from tertiary sites to primary care, which leads to a reduction in sub-speciality units, which harms the quality of training (Degiannis et al., 2009). Policies have led to the absence of those with much-needed experience and expertise (Coovadia, 2009 & Fourie, 1999). Adding to the problem are head-hunters, low salaries of lecturers, and frustration with the standards and administrative structures of the public hospitals, all of which have caused a steady loss of expertise to the private sector. In addition, there is a profound national shortage of medical professionals in South Africa (Crisp, 2011 & George et al., 2019).

Consequently, the author's view is that the private health sector (funders and providers), non-governmental organisations (NGOs), and specialist societies are the primary drive for facial cleft and craniofacial education and services to improve.

The author's recommendation

- a. Initiate a task force group from professionals and experts in the CLP/CFA field to share ideas and information of the current CLP/CFA care and formulate a set of holistic solutions to improve care for all individuals born with cleft lip/palate and craniofacial anomalies (Semb, 2014).
- b. Develop capacity through education:
 - i. Accreditation of sub-speciality units of craniofacial surgery as a special multi-university unit in Gauteng, Western Cape and Kwazulu-Natal and organised by the appropriate multi-specialist societies.
 - ii. Introduce sub-speciality certification (fellowship) training programmes (Silvestre; 2016 & Grewal, 2008). Such training in the CLP/CFA field can be done via a university curriculum with a proposed MPhil degree for all these different disciplines. Furthermore, training can be verified as a sub-speciality (certification) at the Colleges of Medicine of South Africa (CMSA) (for orthodontics, maxillo-facial and oral surgery and plastic surgery). The resources for funding are part of a university degree course, and such a course funding will be subsidised by the National Department of Higher Education and by a student fee structure.
 - iii. Altruism of stakeholders, Professional societies and associations of South Africa to make resources available for researchers and enabling trainees to travel locally and internationally to gain a qualification in the CLP/CFA field in sub-speciality accredited units.

- c. Establish a graduate curriculum in the CLP/CFA field that is retained and assessed to identify strategic learning and include theoretical concepts and multidisciplinary team exposure.
- d. Maintain well-organised multidisciplinary training with a large volume of cases and standardised protocols and establish new multidisciplinary ones.
- e. Strengthen the current and future strategy in keeping the experts in the CLP/CFA by nurturing their expertise in the multidisciplinary team care and stimulating them to provide exceptional service. Also, the Medical and Dental Associations can be negotiated with to improve the medical funding tariffs (medical aid) current fees structure for craniofacial anomalies services as an incentive for sub-specialisation.
- f. Collaboration among professional societies of different disciplines in education and research in CLP/CFA fields.
- g. Form a clinical standard advisory group (Sandy et al., 2001) to provide the expertise and researchers to conduct a clinical audit of the quality of care.
- h. Centralise specialised services involved in the treatment of congenital anomalies conditions like CLP/CFA, to a multidisciplinary centre where a high volume and enough experts are employed (Ness, 2015 & Schoenbrunner et al., 2017).
- i. Reincarnate the South African Cleft Lip/Palate Association (SACLPA):
 - Develop a registration standard for craniofacial multidisciplinary teams
 - Drive public awareness
 - Continue professional education
- j. The Department of Health should substantially improve the detailed registration process of congenital anomalies and associated rare diseases with being able to motivate policymakers and health funders for actions.
- k. Develop an online postgraduate diploma in cleft lip/palate and craniofacial difference for Orthod and SLT.

5.1.1.5.3 Recommendations for further studies

- a. CLP/CFA treatment outcome audit and multicentre comparison.
- b. Assessment of undergraduate and generalist academic education in the CLP/CFA field.
- c. Developing a new efficient tool to Nayar congenital anomalies (Mossey, 2003).

All the above will provide adequate training to equip candidates to provide ideal and comprehensive services for CLP/CFA patients' care.

TABLE 1: Summary of the PhD study recommendations

Recommendations	Individual	Academic institutions	Health authorities	Private stakeholders and societies	HPCSA	CMSA
Task force improve care for all individuals born with CLP/CFA	√	√	√	√	√	
Fellowship/sub-speciality certificate	√	√	√	√	√	√
Education and online resources	√	√		√		
Accreditation of sub-speciality units of craniofacial surgery			√	√		√
Resources available for training				√		
Centralise specialised services of congenital anomalies		√	√	√	√	√
Graduate curriculum in the CLP/CFA field		√				
SACLPA reincarnation	√	√		√		
Congenital anomalies register (National Department of Health)		√	√	√		

CHAPTER 6

6.1 REFERENCES

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CHAPTER 7

7.1 APPENDICES

7.1.1 Appendix 1: Ethics approval (HSS/0235/617D)



25 May 2017

Dr Emad Ghabrial (217016283)
School of Health Sciences
Westville Campus

Dear Dr Ghabrial,

Protocol reference number: HSS/0235/017D

Project title: Assessment of the educational needs and services available in cleft lip/palate and craniofacial deformities management in South Africa

Full Approval - Expedite Application

With regards to your response received on 24 May 2017 to our letter of 08 May 2017, the Humanities & Social Sciences Research Ethics Committee has considered the abovemention application and the protocol has been granted **FULL APPROVAL**.

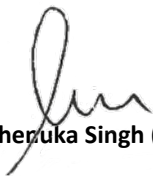
Any alteration/s to the approval research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amended/modification prior to its implementation. In case you have further queries, please quote the above reference number.

PLEASE NOTE: Research data should be securely stored in the discipline/department for a period of 5 years.

The ethical clearance certificate is only valid for a period of 3 years from the date of issue. Thereafter Recertification must be applied fro on an annual basis.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully



Dr Shenzuka Singh (Chair)

/ms

7.1.2 Appendix 2: Research instrument (questionnaire)

Q1 Statement of consent: I have been given an information sheet and I understand the objective of the study. I further understand that my responses will be kept confidential and that it is up to me whether to complete this questionnaire. It has been explained to me that even if I choose not to complete this questionnaire, I should indicate NO in the space below. My refusal to participate will in no way prejudice me. I agree voluntarily to complete the questionnaire (please tick).

- ☐ Yes
- ☐ No

Q2 Define respondents: the following questions are aimed at getting to know the respondents better...

Q3 Are you a specialist in/or studying any of the following in South Africa? (in alphabetical order):

- ☐ Audiology
- ☐ Maxillofacial surgery
- ☐ Orthodontics
- ☐ Plastic surgery
- ☐ Speech-language therapy
- ☐ Postgraduate student
- ☐ None of the above

Q4 How many years of professional experience do you have?

- ☐ Less than 5 years
- ☐ 5-10 years
- ☐ More than 10 years

Q5 Postgraduate students: field of postgraduate study (in alphabetical order):

- ☐ Audiology
- ☐ Maxillofacial surgery
- ☐ Orthodontics
- ☐ Plastic surgery
- ☐ Speech and language therapy

Other, specify _____

Q6 In which year are you now in your postgraduate study?

- ☐ First
- ☐ Second
- ☐ Third
- ☐ Fourth

Degree to obtain _____

Q7 University/institute you are currently enrolled at:

- ☐ University of Cape Town
- ☐ University of Pretoria
- ☐ University of KwaZulu-Natal
- ☐ University of the Free State
- ☐ University of Johannesburg
- ☐ Sefako Makgatho Health Sciences University

Other, please specify _____

Q8 Perception: There are different perceptions about cleft lip/palate and craniofacial deformities.

Please provide your opinion on the following statements. The most common craniofacial facial deformity in humans is cleft lip/palate.

- ☐ True
- ☐ False
- ☐ Do not know

Q9 The incidence of cleft lip/palate is higher in black populations than in white population.

- ☐ True
- ☐ False
- ☐ Do not know

Q10 Unilateral complete cleft lip/palate patients have the following problems:

	How often?			
	Always	Sometimes	Never	Do not know
Feeding				
Speech				
Middle ear infection				
Dental				
Hearing				

Q11 Do you think the patients with a cleft and craniofacial deformity need a multidisciplinary care team?

- ☐ Yes
- ☐ No
- ☐ Do not know

Q12 In your view, what are the specialties needed for the multidisciplinary team members to function?

	Essential	Useful	Not essential	Do not know
Community nurse				
Dentist				
ENT specialist				
Geneticist				
Hearing management				
Maxillofacial surgeon				
Orthodontist				
Plastic surgeon				
Psychologist				
Speech therapist				

Other, specify _____

Q13 Did your undergraduate or postgraduate programme include any of the following in management for patients with cleft lip/palate and craniofacial deformities?

	Undergraduate			Postgraduate		
	Yes	Very little	None	Yes	Very little	None
Didactic (theoretical)						
Clinical experience						
Textbook reading						
Discussion group						
Multidisciplinary meeting						

Q14 Do you consult patients with cleft lip/palate and craniofacial deformities for treatment?

- ☐ Yes
- ☐ No

Q15 In which institution(s) or practice(s) have you treated these patients?

- ☐ Private practice
- ☐ Academic hospital
- ☐ Government hospital
- ☐ Private hospital
- ☐ Charity organisation

Other, specify _____

Q16 Which mission/charity programme?

- ☐ Mercyship
- ☐ Operation smile
- ☐ Smile foundation
- ☐ Smile Train
- ☐ Wentworth Foundation

Other, specify _____

Q17 What action do you take concerning these patients?

- ☐ Treatment/intervention
- ☐ Refer them for treatment

Other, specify _____

Q18 Do you participate in a multidisciplinary cleft care team?

- ☐ Yes
- ☐ No

Q19 Which age group(s) do you treat?

- ☐ Infants
- ☐ 4-6 years
- ☐ 7-10 years
- ☐ 11-18 years
- ☐ Adults
- ☐ All ages

Q20 In your opinion, clinical treatment management for patients with cleft lip/palate and craniofacial deformities:

- ☐ Exceptionally difficult to handle and need special training
- ☐ Easy treatment and do not need special training

Other, specify _____

Q21 You selected exceptionally difficult to handle; provide the reason why?

- ☐ Multidisciplinary
- ☐ Lengthy treatment
- ☐ Patient socioeconomic factor

Other, specify _____

Q22 How confident are you in your expertise to treat and manage patients with cleft lip/palate and craniofacial deformities? (Low confidence is from zero score and higher number up to score 10 indicates high confidence)

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

Q23 Who referred these patients to you?

- ☐ Medical doctor
- ☐ Dentist
- ☐ ENT
- ☐ Gynaecologist
- ☐ Maxillofacial surgeon
- ☐ Internet/web
- ☐ Orthodontist

- Patient's friend/family
- Paediatrician/neonatologist
- Speech-language therapist
- Community nurses

Other, specify _____

Q24 Orthodontics: What was the treatment/participation?

- Pre-surgical infant orthopaedic
- First phase orthodontic
- Preparation for bone graft
- Preparation for orthognathic surgery
- Participate in multidisciplinary team
- Participate in clinical treatment outcome study
- Treat complex craniofacial deformities
- Treat patients with special needs
- Participate in parents and caregiver education

Other, specify _____

Q25 Surgeons: What is your preferred basic surgical protocol in treating unilateral complete cleft lip and palate?

	Procedure		From what age approximately?		
	Yes	No	Week	Month	Year
Pre-surgical plate					
Soft palate closure					
Lip closure					
Hard palate closure					
Alveolar bone grafting					
CLP, lip revision surgery					
CLP, rhinoplasty revision surgery					

Q26 What was the average number of procedures per year?

	Average number per year (click on arrow)				
	None	0-5	5-15	15-30	>30
Repair of cleft lip					
Repair of cleft hard palate					
Repair of soft palate					
Repair of submucosal cleft and/or bifid uvula					
Velopharyngeal reconstruction					
Secondary bone graft procedure					
CLP lip revision surgery					
CLP rhinoplasty revision					

Q27 What was the average number of procedures per year?

	Average number per year (click on arrow)				
	Non	0-5	5-15	15-30	>30
Functional repair of oro-nasal fistula					
Columella lengthening with or without other surgical procedure					
Orthognathic surgery with distraction					
Facial clefts (oblique, lateral etc.)					
Craniofacial surgery					

Q28 You have indicated that you use pre-surgical orthopedics. How often do you use it?

- ☐ Routine > 96%
- ☐ Regularly 76-95%
- ☐ Often 51-75%
- ☐ Occasional 26-50%
- ☐ Seldom 1-25%

Q29 Speech and hearing: What was the assessment and intervention? Please answer both columns.

	Assessment		Intervention's	
	Yes	No	Yes	No
Neonatal (0-28 days) feeding				
Paediatric hearing screening				
Early communication a (0-3 years)				
Articulation disorders				
Velopharyngeal dysfunction				
Language delays/disorders				
Language learning difficulties and auditory processing disorders				
Hearing problems				
Parents interaction				

Q30 What type of pre-surgical orthopedics do you use?

- ☐ ACTIVE pre-surgical orthopedics
- ☐ PASSIVE feeding plate
- ☐ Naso-alveolar moulding

Other appliance, please specify _____

Q31 You selected NO in using a pre-surgical orthopedic plate treatment protocol of UCLP; would you like to use it in future?

- ☐ Yes
- ☐ No, reason _____

Q32 What type of pre-surgical orthopedics do you use?

- ☐ ACTIVE pre-surgical orthopedics
- ☐ PASSIVE feeding plate
- ☐ Naso alveolar molding

Other appliance, please specify _____

Q33 What is preventing you from treating these patients?

- ☐ Lack of interest
- ☐ Limited experience
- ☐ Longevity of treatment
- ☐ Does not pay off

Other, specify _____

Q34 How important is it for you to treat patients with cleft lip/palate and craniofacial deformities?

- ☐ 0
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10

Q35 Education needs and strategy: From your knowledge, is there a dedicated programme in your specialty in South Africa for furthering the knowledge in treating patients with cleft lip/palate and craniofacial deformities?

- ☐ Yes (specify where) _____
- ☐ No
- ☐ Do not know

Q36 Education needs: How would you feel about the need to introduce a dedicated training programme for the treatment of cleft and craniofacial deformities?

- ☐ Agree
- ☐ Do not agree (give reason) _____

Q37 What is the most significant factor in that decision?

- ☐ Lack of time
- ☐ Decreased future income
- ☐ Length of programme
- ☐ No interest
- ☐ Limited access to patients

Others (specify) _____

Q38 If such a programme exists, what programme(s) would you suggest?

- ☐ Full-time
- ☐ Part-time
- ☐ Short courses/workshops

Other (specify) _____

Q39 You selected full-time; what programme duration do you suggest? You can tick multiple.

- ☐ <12 months
- ☐ 12 months
- ☐ 24 months
- ☐ >24 months

Q40 What type of course would you recommend? You can tick multiple.

- ☐ Degree course, e.g. diploma, master's
- ☐ Non-degree course, e.g. fellowship
- ☐ CPD courses

Other, specify _____

Q41 In your opinion, what is the candidate's most significant reason(s) for enrolment in such professional programme?

- ☐ Interest
- ☐ Qualification/degree
- ☐ Community needs
- ☐ Improve income
- ☐ Join established CLP/craniofacial treatment team
- ☐ Passion

Other (specify) _____

Q42 In your view, what is the training programme goal and objectives?

	Essential	Not essential	Possibly enhance
In-depth knowledge			
Diagnosis and treatment planning			
Clinical skills			
Multidisciplinary approach			
Teamwork skills			
Clinical research			
Special need care			
Teaching			
Global training (charity missions)			

Q43 Admission requirements

	Essential	Not essential	Possibly enhance
Professional degree(s)			
Clinical experience			
HPCSA registration			
Admission exam			

Other requirement(s), please specify _____

Q44 In your view what should be the learning activities in such programme?

	Essential	Not essential	Possibly enhance
Lectures			
Discussions			
Logbook/clinical hours form			
Clinical research			
Assignment topics			
Journal discussions			
Textbook reviews			

Q45 Continued, the learning activities in such programme?

	Essential	Not essential	Possibly enhance
Skills in dealing with special needs			
Web-based e-learning			
Supervised participation in CLP and craniofacial team activities and meetings			
Participate in treatment outcome studies			
Participate in charitable health missions			

Q46 Assessment and evaluation

	Essential	Not essential	Possibly enhance
Final exam			
Semi-annual exam			
Logbook/clinical requirements			
Publication			
Continuous evaluation			
Assignment/seminar			

Other, please specify _____

Q47 Thank you, you are nearing the end of the survey. Please could you answer a few demographic questions that will help to understand the results of the survey better. Title:

- ☐ Dr
- ☐ Prof

Other _____

Q48 Gender

- ☐ Male
- ☐ Female

Q49 Age

- ☐ < 0 years
- ☐ 30-50 years
- ☐ 50-65 years
- ☐ >65 years

Q50 In which province or country(s) do you currently practise?

- ☐ Eastern Cape
- ☐ Free State
- ☐ Gauteng
- ☐ KwaZulu-Natal
- ☐ Limpopo
- ☐ Mpumalanga
- ☐ Northern Cape
- ☐ North West
- ☐ Western Cape

Country _____

Q51 How would you describe yourself in terms of your population group?

- ☐ Black African
- ☐ Cape Coloured
- ☐ Indian
- ☐ Asian
- ☐ White
- ☐ Other: Please specify _____
- ☐ Refuse

7.1.3 Appendix 3: Electronic informed consent



UNIVERSITY OF
KWAZULU-NATAL
INYUVESI
YAK WAZULU- NATALI

SCHOOL OF HEALTH SCIENCE (DIVISION OF DENTISTRY)
Informed Consent

Dear Colleague,

Invitation to participate in a Cleft lip/palate and craniofacial deformities study

The Faculty of Health Sciences, Division of Dentistry, University of KwaZulu-Natal (UKZN), is in the process of researching the perceptions of the core professionals involved in the treatment of cleft lip/palate (CLP) and other craniofacial deformities (CFD). Namely,

The aim is to plan and execute a strategy to ensure the optimisation of cleft lip/palate and craniofacial education and treatment management.

The title of the research is as follows:

"Assessment of the educational needs and services available in cleft lip/palate and craniofacial deformities management in South Africa."

Your valuable participation in the project is kindly requested. The of the included professionals in the treatment of CLP and CFO, within the borders of South Africa, are invited to participate in the survey.

Your participation in the survey entitles you to be informed about the following conditions, in line with UKZN ethical standards:

Participation is voluntary, and you will not be able to withdraw from the study once your anonymous questionnaire submitted.

Your response to the survey will be regarded as confidential, and you will not be identified in reports in any way.

The results of the study will be available in an aggregate format only, and you will remain anonymous at all times. The results will be reported in internal institutional reports.

Should the data be used for other research purposes such as scientific articles or conference papers, you will remain anonymous at all times and the data will be presented in an aggregate format only.

Data will be stored for 15 years under the University of KwaZulu-Natal's regulations.

You have the right of access to the researchers to clarify any issue, should doubts arise or any clarification sought.

Findings from the study will be published in an appropriate journal.

If you have any questions regarding the research/questionnaire, please contact Emad Ghabrial at 012 319 2609 or emad@iafrica.com.

Your input will contribute significantly toward this research project. The cut-off date for the survey is -----, and completing the questionnaire should not take more than 25 minutes of your time. You are kindly requested to respond at your earliest convenience. If you consent to participate in the project, please click on the following link to complete the online questionnaire:

We would like to sincerely thank you in advance for your willingness to participate in this research project.

The members of the research team are:

Emad Ghabrial (orthodontist)

Kurt Bütow (maxillofacial and oral surgeon)

Thank you once again for your participation and honest feedback.

7.1.4 Appendix 4: Email survey link to health professionals

CLEFT LIP/PALATE EDUCATION AND SERVICE IN SOUTH AFRICA

Help in the academic education in Cleft lip/palate and craniofacial deformities by participating.

CLP academic education and services Orthodontics

We are exploring the cleft lip/palate and craniofacial deformities (CLP & CFD) knowledge and skills in South Africa and would like to know about your experience.

Dear Participant

My name is Emad Ghabrial, I am a staff member at the UP School of Oral Health Sciences. I am currently enrolled for a PhD at the UKZN School of Health and Sciences with Prof K Bütow as a supervisor, and as part of that, I am conducting research to evaluate the perceived knowledge and skills of managing CLP in South Africa.

Purpose of the study

This study will provide guidance to whether there is a gap in CLP & CFD academic training in South Africa and explore the need for postgraduate training in the field of CLP & CFD.

How comfortable do you feel when you consult or treat CLP/CFD?

Have your say: Please take approximately 10 minutes to complete the anonymous survey, by clicking on the link below:

CLP academic education and services Orthodontics

*Your participation in this study is voluntary. By taking the survey, your consent is implied, and you declare yourself prepared to participate in the study when doing so. The survey is completely anonymous, with no link to the participant. You will not be identifiable in the research process. Data may be reported in scientific journals. The outcome information may be used for presentation or publication in the future. This research project is strictly voluntary, should you have any questions about this or wish please contact the author: emad.ghabrial@up.ac.za

7.1.5 Appendix 5: Telephone call and interview script

Call for an appointment:

I am ... from Dr Ghabrial of the University of Pretoria

Dr/Prof ... has been selected as an expert opinion about developing academic education regarding cleft lip and palate. I would like to set an appointment to have a telephone interview of 10 minutes to share your expertise regarding MFOS cleft lip and palate education and training in South Africa

Appointment date and time

Calling the Dr/Prof/Ms/Mr

Thank you for participating in UKZN Education assessment of cleft lip and palate in South Africa

On behalf of Dr Ghabrial of the University of Pretoria

We are considering the need for an education programme for cleft lip and palate treatment

I would like to take 10 minutes of your time to go through a survey questionnaire. This would help to figure out what best we can do to professionally address the MFOS education programme regarding cleft lip and palate in South Africa

Consent to participate

Questionnaire...

Thank you, would you like to receive the results of the study? (if yes, check email address and other contact information)

7.1.6 Appendix 6: Example of gatekeeper permission

Re: Speech-language-hearing practitioners: Cleft lip/Palate and Craniofacial anomalies Survey 1 message

Erika Bostock <eribost@gmail.com> Fri, Aug 5, 2016 at 6:36 AM

To: Dr Emad Ghabrial <pretoriasmile@gmail.com>

Cc: Ingrid Von Bentheim speechrx@xsinet.co.za

Dear Prof Ghabrial and Prof Bütow

We will gladly distribute your survey to our SASLHA members, but please could you provide us with the necessary information regarding ethical clearance for the research? I will also distribute the survey to my mailing list, many of whom are therapists who are not SASLHA members.

Kind regards,

Erika

On 5 Aug 2016 06:24, "Dr Emad Ghabrial" <pretoriasmile@gmail.com> wrote:

Dear Dr Erika Bostock

Invitation to distribute a survey to your members to participate in a study on cleft lip/palate and craniofacial deformities

We, Professors Kurt Bütow (maxillofacial and oral surgeon) and Emad Ghabrial (orthodontist), would like to invite your members to take a survey to identify orthodontists' perceptions regarding cleft lip/palate and craniofacial education and service management in South Africa as a part of a research project.

The aim is to plan and execute a strategy to expand the knowledge of speech-language-hearing practitioners' roles and responsibilities and to incorporate this knowledge in the educating and training of future professionals in cleft lip/palate and craniofacial education and service management.

Participation in this research is voluntary. Your members may refuse to participate and may quit at any time. For questions, comments or concerns, please contact Emad Ghabrial at 083 448 8338 or emad.ghabrial@up.ac.za, or Kurt Bütow at kurt@butow.co.za.

We appreciate your kind assistance in approving the distribution of the survey to your members.

Kind regards

E Ghabrial Orthodontist

7.1.7 Appendix 7: Medpages gatekeeper permission



T 021 441 9700 F 021 441 9701
2nd Floor, 50 Riebeek Street, Cape Town, South Africa
PO Box 322, Green Point, 8051, South Africa
info@medpages.info
www.medpages.info

To whom it may concern.

This letter serves to confirm that Medpages is a data management company for healthcare provider contact information across Africa.

Medpages has provided Dr E Ghabrial with the contact list of healthcare professionals for his research in alignment with our mandate of providing healthcare data to relevant stakeholders in the industry.

As Medpages is a data management company focused on collecting, verifying, maintaining and providing quality healthcare data solutions for the entire healthcare sector, we believe that the data provided to Dr E Ghabrial is an accurate a reflection of current health professionals industry in South Africa.

.....
Benjamin Dadon
Co-CEO Medpages

7.1.8 Appendix 8: GGRF funds award



Dr Emad Ghabrial,
Orthodontic Department
Oral and Dental Hospital,
Pretoria,

20th December 2017

Dear Dr Ghabrial,

The trustees of the Gerald Gavron Reserve Fund (GGRF) have met to consider your application for funding towards a PhD degree entitled “Assessment of the educational needs and services available in cleft lip and palate and craniofacial deformities management in South Africa” in the School of Health Sciences, Westville Campus, University of Kwazulu-Natal.

In principle it was agreed that you should be awarded funding as there is a need to develop a uniform and consistent approach to the management of these patients as the orthodontic speciality plays an integral role in this regard.

The amount was determined at R25,000.00 and this will be paid in two equal instalments subject to the satisfaction of your supervisor and on invoicing, namely on completion of the pilot study and then on completion of the main section.

It will be incumbent upon you to abide by the rules of the GGRF for the awarding of funds for research purposes which were sent to you. You will be required to send progress reports to the GGRF every four to six months and from time to time to support your progress by delivering lectures to the membership of SASO.

We require that you advise the GGRF of any additional funding that you may be awarded.

We applaud your commitment, wish you well with the project and look forward to your results.

Yours sincerely,

Prof AGH McCollum

Chairman GGRF

Trustees: Professors S.Chertkow, W.Evans, E. Stein and Dr M Wertheimer

7.1.9 Appendix 9: Editing certificate

LANGUAGE EDITING STATEMENT

12 April 2020

Assessment of the educational needs and services available in cleft lip/palate and craniofacial deformities management in South Africa

By EAM Ghabrial

Herewith I declare that I have edited the abovementioned document regarding:

- Grammar and spelling
- Consistency
- Logical flow of language
- Referencing style

No structural rewriting of the content was done.

Sincerely

M E van Loggerenberg



Michele van Loggerenberg
Full Member

Membership number: VAN015
Membership year: March 2020 to February 2021

083 281 9944
kiddo@yebo.co.za

www.editors.org.za

7.1.10 Appendix 10: Originality certificate

Turnitin Originality Report

Thesis 12032020 by Emad Ghabrial

From Thesis 12032020 (ORD 803 Y1 2020 _132342_1)



- Processed on 12-Mar-2020 18:38 SAST
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sources:

There are no matching sources for this report.

7.1.11 Appendix 11: Oral presentation at ICPF 2018

ICPF 2018: Letter of acceptance

1 message

icpf2018 <support@abstract-management.de>
Reply-To: kbaetzel@eventlab.org
To: emad.ghabrial@up.ac.za

2 February 2018 at 14:18

Dear Emad Ghabrial,

Preparations for the 12th World Congress of ICPF are advancing very well.

The evaluation of the abstracts has been finished, and we are pleased to inform you that your abstract (*ID 16*) entitled “*Assessment of the speech therapy and audiology services and education regarding cleft lip/palate and craniofacial deformities in South Africa*” **has been accepted for oral presentation**.

Further details on your talk (the specific session you will be speaking at, speaking time, etc.) will be provided soon.

We kindly ask you to proceed with registration until February 10, 2018 to benefit from the early bird registration fee.

Please feel free to contact us if you have any queries at all.

We look forward to welcoming you to Leipzig.

Kind regards,

Clarissa Strietzel

ICPF 2018 Conference Office Team

Event lab. GmbH

Dufourstr. 15
D-04107 Leipzig

Tel.: +49 (0) 341 240596-90
Fax.: +49 (0) 341 240596-51

7.1.12 Appendix 12: Abstract 016 ICPF 2018

Date: 20 April 2018

Assessment of the speech therapy and audiology services and the academic education of these professionals regarding cleft lip/palate and craniofacial deformities in South Africa

E. Ghabrial

Objectives

- Measure the exposure and knowledge level of speech therapists and audiologists involved in cleft lip/palate (CLP) and craniofacial deformities (CFD) management.
- Describe the services provided by the speech therapists and audiologists to CLP/CFD patients in South Africa.
- Obtain an opinion from speech therapists and audiologists about the current CLP/CFD educational needs.

Method

An online survey and telephone interviews through a structured questionnaire to investigate the services and education provided to CLP/CFD patients.

Result

The questionnaire was completed by 123 speech therapists and audiologists, of which 70% have more than 10 years of professional experience. Of the respondents, 60% showed a good general knowledge of CLP/CFD. However, 80,8% acknowledged their limited clinical exposure during their academic education. Only 42,4% of the professionals offer treatment for CLP/CFD patients, and 26,5% of them participate in multidisciplinary teams. Most of them, i.e. 96% of the respondents, agreed on the need to improve the academic education, and the majority recommended certified short courses, workshops and online courses.

Conclusion

There is a need to establish an educational strategy to meet the needs of CLP/CFD management services. This study also provided information about the speech therapy and audiology assessment and intervention protocol of CLP/CFD in South Africa.

7.1.13 Appendix 13: Acceptance of IADR abstract

48TH SCIENTIFIC MEETING OF THE SOUTH AFRICAN DIVISION OF THE IADR Abstracts Acceptance Notification

1 message

Sizakele Ngwenya <Sizakele.Ngwenya@wits.ac.za>

Fri, Jul 27, 2018 at 10:49 AM

To: "emad@iafrica.com" <emad@iafrica.com>

Cc: Hazel Makhubele <Hazel.Makhubele@wits.ac.za>, Julitha Molepo <Julitha.Molepo@wits.ac.za>

Dear Emad Ghabrial

On behalf of the Local Organising Committee of the 48th Scientific Meeting of the South African Division of the **IADR** we have the pleasure to inform you that the abstract titled **"Assessment of the maxillo-facial & oral surgeon's academic education and services regarding cleft lip/palate and craniofacial differences in South Africa"** that you submitted is accepted for a Poster Presentation.

7.1.14 Appendix 14: SA-IADR2018/48th International South African Dental Research Meetings

Date: 30 and 31 August 2018

Abstract (ID: 2974343) entitled, Assessment of the maxillofacial and oral surgeon's academic education and services regarding cleft lip/palate and craniofacial differences in South Africa.

Objectives

Measure the exposure and knowledge level of maxillofacial and oral surgeons (MFOS) in cleft lip/palate (CLP) and craniofacial deformities (CFD) management.

Describe the services provided by MFOS to CLP/CFD patients in South Africa.

Obtain an opinion from maxillofacial and oral surgeons about the current CLP/CFD academic educational needs.

Methods

An online survey and telephone interviews through a structured questionnaire to investigate the MFOS academic education and services provided to CLP/CFD patients.

Results

The questionnaire completed by 51 maxillofacial surgeons, of which 64,81% have more than 10 years of professional experience. Of the respondents, 62% showed a good general knowledge of CLP/CFD. However, 80,8% MFOS acknowledged their limited clinical exposure during their academic education. Only 42,4% of the professionals offer treatment for CLP/CFD patients, and 26,5% of them participate in multidisciplinary teams. 92,59% of the respondents agreed on the need for a dedicated academic training programme for CLP/CFD management, 40,79% suggested full-time degree courses and 36,84% suggested non-degree courses and fellowship.

Conclusions

There is a need to establish an educational strategy for CLP/CFD clinical management services. This study also provided information about the MFOS management protocol of CLP/CFD in South Africa.