Specialised medical professionals' perspectives on oral feeding of infants and young children receiving high flow oxygen

In partial fulfilment of the requirements for the degree BA Speech-Language Pathology

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Declaration of Originality

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Abstract

Background: Current research on the safety of oral feeding in infants and young children receiving high-flow oxygen therapy is limited, with differing views on decision-making in these cases.

Aim: The aim was to explore perspectives of specialised medical professionals in South Africa regarding oral feeding practices of young children receiving high-flow oxygen therapy.

Method: A 40-item electronic survey was completed by 37 South African specialised medical professionals. Non-probability, purposive sampling was used to recruit participants. Data were analysed descriptively.

Results: The findings revealed varied perspectives on oral feeding practices for infants and young children on nasal continuous positive airway pressure (nCPAP) and high-flow nasal cannula (HFNC) oxygen therapy, with greater caution towards nCPAP due to higher perceived aspiration risks. Participants indicated a lack of guidelines (n=32; 97.0%) to follow regarding feeding practices with this population, with varied perspectives on oral feeding when on high-flow oxygen. Decisions are often made individually (n=15; 44.1%), but rarely made by a team. A cautious feeding approach monitoring clinical signs of aspiration was often (n=25; 78.1%) recommended with limited informal (n=13; 38.2%) and instrumental (n=12; 35.0%) assessment available and inconsistent SLT collaboration (n=9; 24.3%) despite access to SLT services (n=34; 79.4%).

Conclusion: The study underscores varied approaches to oral feeding in infants and young children on high flow oxygen therapy among South African specialised medical professionals. The lack of research and established guidelines, and inconsistent use of formal measures to assess feeding, and limited multidisciplinary decisions are highlighted.

Key words: High-flow oxygen therapy, high-flow nasal cannula, nasal continuous positive airway pressure, oral feeding practices, infants, young children, specialised medical professionals, perspectives, survey.

List of abbreviations

FEES: Fiberoptic Endoscopic Evaluation of Swallowing

HFNC: High-flow nasal cannula

HPCSA: Health Professions Council of South Africa

LFNC: Low-flow nasal cannula

MBS: Modified Barium Swallow

nCPAP: Nasal continuous positive airway pressure

NICU: Neonatal intensive care unit

PICU: Paediatric intensive care unit

Qualtrics-XM: Qualtrics Experience Management

SLT: Speech language therapist

VFSS: Videofluoroscopic Swallow Study

WHO: World Health Organisation

Introduction

1.1 Introduction

High-flow oxygen delivers a warm, humidified blend of oxygen and air through thin, binasal tubes at gas flow rates exceeding one litre per minute (Charlton et al., 2022; Wilkinson et al., 2016). There are various methods through which high-flow oxygen is delivered including HFNC oxygen therapy and nCPAP (Canning et al., 2019). These non-invasive ventilation methods are frequently administered to infants and young children in neonatal and paediatric intensive care units (NICU/PICU) to provide respiratory support for conditions like respiratory failure or chronic lung disease (Canning et al., 2019).

While high-flow oxygen therapy permits oral feeding in young children, limited data supports its safety. Globally specialised medical professionals, including doctors training in emergency medicine or paediatrics as well as specialists such as physicians, paediatricians, neonatologists, emergency specialists, and registered nurses, hold differing opinions on oral feeding of young children while receiving high-flow oxygen therapy and most facilities lack feeding practice guidelines for young children undergoing high-flow oxygen therapy (Barnes et al., 2023; Charlton et al., 2022; Hoosain et al., 2024; O'Brien et al., 2023). Available literature also exhibits disparities in defining high-flow oxygen therapy, particularly concerning variables such as flow rate (Canning et al., 2021). Furthermore, there is no known published literature available in Sub-Saharan Africa on the use of specifically HFNC oxygen therapy in children, warranting further investigation (Hoffman et al., 2019).

Specialised medical professionals exhibit varying opinions and a lack of consensus regarding the safety, timing, decision-making and implementation of oral feeding during high-flow oxygen therapy (Barnes et al., 2023; Canning et al., 2019; Conway et al., 2021; Raminick et al., 2020; Rice & Lefton-Greif, 2022). Research on South African medical professionals' perspectives regarding oral feeding practices for infants receiving high-flow oxygen therapy is limited, warranting the current study.

The literature indicates a clear distinction between those who support the practice of oral feeding in paediatric populations while on high-flow oxygen therapy and those who caution against it (Conway et al., 2021; Gray et al., 2023; Hoosain et al., 2024; Kalburgi et al., 2018; Leder et al., 2016; Rice et al., 2022; Shetty et al., 2016; Shimizu et al., 2019). Recent research recommends introducing oral feeding whilst on high-flow oxygen therapy, with studies indicating no feeding-related complications and supporting its safety and potential benefits (Gray et al., 2023; Kalburgi et al., 2018; Leder et al., 2016; Rice et al., 2022; Shetty et al., 2016; Shimizu et al., 2019). Oral feeding benefits include accelerating oral feeding milestones, facilitating weight gain, preventing complications such as oral aversion and reducing the infants' and young children's hospital stays (Conway et al., 2021; Gray et al., 2023; Hoosain et al., 2024; Kalburgi et al., 2018; Leder et al., 2016; Rice et al., 2022; Shetty et al., 2016; Shimizu et al., 2019). By providing continuous positive airway pressure (CPAP), high-flow oxygen therapy enhances swallowing, facilitates a smoother transition between tube and oral feeding and prevents aspiration (Kalburgi et al., 2018; Rice et al., 2022).

Conversely, other literature questions the evidence supporting oral feeding in conjunction with high-flow oxygen therapy and suggests delaying oral feeding until patients are no longer on high-flow oxygen therapy (Canning et al., 2019; Dodrill et al., 2016; Hoffman et al., 2016; Taha et al., 2016). Such uncertainties persist due to a critical lack of research on the safety, impact, and timing of oral feeding in paediatric patients undergoing high-flow oxygen therapy, especially when diagnosed with acute respiratory illness, warranting the need for further investigation (Conway et al., 2021; Leder et al., 2016; Raminick et al., 2020). This includes the absence of current evidence on whether high-flow oxygen therapy's pharyngeal pressure disrupts an infant's suck, swallow and breathe coordination or compromises their airway protection during feeding; whether it increases the risk of oropharyngeal aspiration or the development of aspiration pneumonia in NICU patients, and whether it supports the transition to full oral feeds (Canning et al., 2021; Conway et al., 2021; Dodrill et al., 2016; Kalburgi et al., 2018; Raminick et al., 2020; Taha et al., 2016).

Infants and young children in NICUs and PICUs often receive either HFNC oxygen therapy or nCPAP as noninvasive ventilation methods (Canning et al., 2019). nCPAP

delivers positive airway pressure through nasal prongs or masks whereas, HFNC oxygen therapy delivers oxygen through nasal prongs (Lemyre et al., 2023). However, both methods may impact feeding intolerance or lead to complications as the pressurised gas intended for the respiratory tract may also enter the gastrointestinal tract, causing gastric and abdominal distention (Cresi et al., 2023). However, recent evidence indicates no difference in feeding intolerance between the two methods (Cresi et al., 2023). Furthermore, there is apprehension regarding the lack of evidence of the effects of HFNC oxygen therapy on the 'morbidity', 'mortality' and 'desired respiratory and feeding outcomes' of young children (Rice et al., 2022). This therapy may induce respiratory distress, lead to oropharyngeal dysphagia, and possibly increase the risk of aspiration, potentially lengthening hospital stay, supporting the need for further research (Barnes et al., 2023; Canning et al., 2019; Capilouto, 2017). Even authors who advocate for initiating oral feeds during HFNC oxygen therapy, emphasise the necessity for additional research to clearly define optimal management practices (Hoosain et al., 2024; Kalburgi et al., 2018). Hence, more research is required in this area, specifically on the benefits and risks of delayed or early initiation of oral feeds whilst on HFNC versus nCPAP oxygen therapy (Dodrill et al., 2016).

In South Africa, there are no known guidelines informing feeding decisions for children on high-flow oxygen therapy (Hoosain et al., 2024). Globally, clinicians may not be including instrumental assessment tools or following guidelines when making decisions surrounding oral feeding swallow safety in infants receiving high-flow oxygen therapy, posing a threat to this population and warranting further prospective studies in this regard (Barnes et al., 2023; Canning et al., 2021; Charlton et al., 2022; Cresi et al., 2023; Raminick et al., 2020; Rice et al., 2022). Evidence from instrumental swallow assessments is essential to determine the presence of silent aspiration, as well as the short- and long-term effects and oral feeding safety for infants on high-flow oxygen therapy (Canning et al., 2019; Hoosain et al., 2024). The lack of established guidelines and underutilisation of instrumental assessment tools highlight the need for further research to better inform healthcare team members and the challenging decision-making processes they need to make to ensure safe feeding practices for infants on high-flow oxygen therapy (Cresi et al., 2023; Hoosain et al., 2024).

Research has either found a lack of consistency or absence of guidelines for initiating oral feeding while on high-flow oxygen therapy in the infant population and guideline recommendations showed greater variation when suitable evidence was not accessible (Bakker et al., 2021; Ghayum et al., 2022). Not only is there a lack of guidelines about oral feeding of infants receiving high-flow oxygen therapy in general, but oral feeding guidelines relating to specific conditions such as syncytial virus or bronchiolitis (Raminick et al., 2020), very low birth weight, and oral feeding difficulties (Shimizu et al., 2019). As these unique diagnoses and comorbidities should influence the decision regarding commencing oral feeding on high-flow oxygen therapy, the team members involved must take them into consideration (Rice et al., 2022). In South Africa establishing and implementing guidelines is vital for improving consistency of practice (Hoffman et al., 2019; Raminick et al., 2020).

A cautious and multidisciplinary approach is thus recommended, where decisions are made within a team to holistically treat the patient for better outcomes (Conway et al., 2021; Kalburgi et al., 2018). This approach suggests that instead of excluding oral feeds during high-flow oxygen therapy, small amounts of oral feeding of specific consistencies should be cautiously introduced on a case-by-case basis (Hoosain et al., 2024). Emphasising the need to monitor individual patient's risk factors, characteristics and respiratory support, and closely observe the neonate's respiratory status during feeding to identify signs of aspiration or feeding intolerance is suggested (Conway et al., 2021; Hoosain et al., 2024; Kalburgi et al., 2018).

Speech-language therapists (SLTs) play an integral role in providing feeding recommendations for infants and young children, including those receiving high-flow oxygen therapy. These recommendations contribute to the decisions made by specialised medical professionals in such cases. However, due to the insufficient research and guidelines available on the safety of oral feeding during high-flow oxygen therapy, SLTs, in close collaboration with medical professionals, face challenges when making informed decisions (Hoosain et al., 2024). With limited understanding of the varied opinions on this topic, it is important to obtain the views of specialised medical professionals to develop a comprehensive understanding of the challenges and concerns surrounding the outcomes of oral feeding in infants and young children

receiving high-flow oxygen therapy to inform decisions in the long term for both specialised medical professionals and SLTs (Canning et al., 2019; Rice and Lefton-Greif, 2022). This is particularly crucial as the gap in knowledge regarding the safety of oral feeding during high-flow oxygen therapy poses a challenge for medical professionals and SLTs collaborating to make well-informed and consistent decisions about the management of this population in the NICU and PICU. Furthermore, gaining a deeper understanding of the diverse perspectives among medical professionals can help identify and mitigate potential inconsistencies in practice, thereby promoting safer and effective feeding outcomes for infants and young children receiving high-flow oxygen therapy.

This study thus aimed to explore the perspectives of a sample of South African specialised medical professionals regarding oral feeding of infants and young children receiving high-flow oxygen therapy.

1.2 Problem statement and research question

1.2.1 Problem statement

This study aimed to bridge the gap in understanding the perspectives of specialised medical professionals in South Africa concerning their oral feeding practices with infants and young children on high-flow oxygen therapy. High-flow oxygen therapy, a non-invasive ventilation method, allows for oral feeding during its use (Charlton et al., 2022; Wilkinson et al., 2016). However, there is a dearth of data supporting its application in young children, with no published data available in sub-Saharan Africa (Hoffman et al., 2019; Hoosain et al., 2024). Compounding this issue, medical professionals hold varied opinions regarding the safety of oral feeding on nCPAP and HFNC oxygen therapy (Canning et al., 2019). Given the crucial role of effective oral feeding in the recovery, health, and development of young patients, further research on this subject is imperative.

1.2.2 Research question

The research question for the study was as follows: “What are the perspectives of a sample of South African medical professionals regarding oral feeding in infants and young children receiving high-flow oxygen?”

1.3 Terminology

‘High-flow Oxygen’

The term high-flow oxygen refers to a non-invasive ventilation method of oxygen therapy in which a warm, humidified blend of oxygen and air is delivered through thin, binasal tubes at gas flow rates higher than 1 litre per minute (Charlton et al., 2022; Wilkinson et al., 2016;). There are various methods through which high-flow oxygen is delivered including HFNC oxygen therapy and nCPAP (Canning et al., 2019). It is frequently used in NICUs and PICUs to provide respiratory support to infants and young children with diverse conditions, including respiratory failure or chronic lung disease (Canning et al., 2019).

‘Neonates/Young Children’

Young children include patients treated in the NICU and PICU. A child, under the age of 28 days, is considered a neonate and is generally treated in the NICU (WHO, 2018). In South Africa, the PICU generally treats children 12 years and younger (Stefan & van der Merwe, 2008). According to Cheema et al. (2013) younger children are considered age three and below and an older child, from three to 12 years of age. This research will focus on neonates and/or young children receiving high-flow oxygen therapy in the NICU and PICU, and therefore will range from ages birth up until 12 years of age.

‘Specialised medical professionals’

In the context of our study, specialised medical professionals refer to healthcare practitioners with expertise or training in neonatal and paediatric care (Canning et al., 2019). This includes the professionals working in the NICU and the PICU such as doctors who are training as registrars, consultants and fellows (training in paediatrics or emergency medicine), medical specialists (paediatricians, neonatologists, emergency specialists or physicians) and registered nurses (O’Brien et al., 2023).

Method

2.1 Study aim

The aim of this study was to explore and describe the perspectives of a sample of South African specialised medical professionals regarding oral feeding of young children receiving high-flow oxygen therapy.

2.2 Research design

A cross-sectional descriptive survey design was adapted from a previously published questionnaire by Canning et al. (2019), to explore the perspectives of specialised medical professionals regarding oral feeding practices of young children receiving HFNC oxygen therapy and nCPAP. A descriptive survey design allowed for insight into identifying current oral feeding practices and subjective views, beliefs and opinions of the research participants to be gathered (Brink et al., 2018). An electronic survey was used to obtain participants' responses in an inexpensive manner, less time-consuming and easy to distribute, reaching a large population over a broad geographical area (Siedlecki, 2020). The survey predominantly focused on quantitative data with majority closed-ended questions and a qualitative component of one open-ended question for participants to openly elaborate on their perspective, providing a broader insight into their opinions.

2.3 Ethical considerations

The University of Pretoria's Speech-Language Pathology and Audiology's Research Ethics Committee reviewed the study and provided clearance. The following ethical research principles, consistent with the Declaration of Helsinki principles (World Medical Association, 2013), were upheld:

2.3.1 Non-maleficence and beneficence

Participants could end the survey at any given time and were not forced to complete it. The survey took about 15 minutes to complete to minimise any discomfort while filling in the survey. Participants' personal and identifying information, will not be shared to protect their privacy and reputation (Brink et al., 2018). The researchers conducted a risk-benefit ratio to ensure that the positive aspects of the study, such as its value and overall knowledge contribution, outweighed the possibility of harm being

caused to the participants during the study (Brink et al., 2018). The possible benefits of the study included increasing the knowledge of specialised medical professionals' perspectives on oral feeding practices of the neonatal and paediatric population while utilising high-flow oxygen therapy specifically in the South African context which is not well researched globally. A potential risk of the study for the participants was becoming disinterested or restless whilst completing the survey, however, we attempted to mitigate this by ensuring that the survey was not time-consuming.

2.3.2 Autonomy/ Informed consent

The electronic survey was completed voluntarily by participants who were required to tick the checkbox to agree to the informed consent before starting the survey. There were no incentives for the participants to complete the survey. The infographic advertising the study with the electronic survey link, provided information about the survey. The participants were aware that they could return to previous questions to adjust answers if needed and once the survey had been submitted, they were unable to withdraw their participation. Permission was sought from Facebook group administrators and consent forms were sent to the Facebook groups where the electronic survey was advertised and available to the participants.

2.3.3 Justice

All eligible individuals who expressed interest and met the inclusion criteria had an equal opportunity to participate in the study. Participants could do so by accessing the electronic survey through a provided link available on relevant social media platforms. To optimise efficiency, individuals who did not fulfil the inclusion criteria were promptly excluded from the survey. No exclusions were made based on factors such as race, gender, culture, or religion.

2.3.4 Confidentiality

The researchers ensured confidentiality and privacy by preventing the study's data from being linked to the participant's personal information by assigning an alphanumeric code where applicable (e.g., P01). The latter was not shared in the academic report (Brink et al., 2018). Further, the completed survey's results were

protected by the Qualtrics Experience Management (XM) secure software. Participants were informed of this before completing the survey.

2.3.5 Publication of findings

The researchers took every possible measure to report accurate study results. To prevent any possible misinterpretations, the findings were presented as explicitly and unambiguously as possible. The study's limitations were acknowledged in our commitment to transparency and academic integrity (Brink et al., 2018). Appropriate accreditation of all consulted sources was included within the study's text and reference list (Leedy & Ormrod, 2014).

2.4 Setting

The data collected occurred through an online survey distributed to specialised medical professionals registered with the Health Professions Council of South Africa (HPCSA) who are involved in the care of infants or young children receiving high-flow oxygen therapy in healthcare settings around South Africa. The survey link was distributed via two Facebook groups, a WhatsApp group and emails sent to various specialised medical professionals who were encouraged to use snowball sampling to extend the survey to their colleagues. Consequently, the precise number of medical professionals who received and accessed the survey link remains unknown.

2.5 Sampling

Non-probability, purposive sampling was used to recruit 37 specialised medical professionals from the South African population. The use of this sampling method allowed for the opinion and experiences of the precise population group to be achieved (Singh et al., 2023). All potential participants who fit the inclusion criteria had an equal chance to take part in the study. Convenience snowball sampling was also used to recruit participants as this method allowed the participating participants to share the survey to potential participants who held the target characteristics, thereby extending the reach of the survey (Singh et al., 2023).

The minimum required sample size is 30 participants to prevent idiosyncratic findings and to maintain the anonymity of participants (Brink et al., 2018) as well as following the Central Limit Theorem suggesting that using a sample size of 30 or more closely resembles the normal distribution of a population (Kwak & Kim, 2017). The final sample size was 37 participants who fit the inclusion criteria and completed the survey.

2.5.1 Participant selection

Participants were eligible to participate in the study based on the following inclusion criteria:

- Being specialised medical professionals with the necessary qualifications to be doctors such as registrars, consultants and fellows (training in paediatrics or emergency medicine), specialists (paediatricians, neonatologists, emergency specialists or physicians) and registered nurses.
- All participants should be registered with the HPCSA or their relevant professional body (self-reported).
- All participants needed to be based in South Africa.
- All participants should have a minimum of six months experience working with infants and young children on high-flow oxygen, with knowledge of their feeding practices within the last five years.
- All participants should have experience working within NICUs and PICUs where HFNC and/or nCPAP oxygen therapy is provided on a regular basis (Canning et al., 2019).
- All participants required proficiency in English, as this is the language in which the survey was conducted.
- All participants required access to an internet connection with a computer, tablet or mobile device to access and fill in the electronic survey.

2.6 Participant description

A total of 51 individual responses were received, of which 14 were excluded because of incomplete responses. The final analysis included 37 participants' responses (Table 1). Over a third of the sample was between 30-39 years old (n=16; 43.2%), followed by 29.7% between the ages of 40-49 years old (n=11) and 13.5% between 50-59 years old (n=5). The majority of participants were employed in the public health sector (n=24;

64.9%) with the remainder in private (n=13; 35.1%) and 43% (n=16) were employed in Gauteng. The majority (n=28; 75%) of the sample had experience of six to 10 years or more working in their respective NICU or PICU units and working with young children using high-flow oxygen therapy (n=15; 46.9%). A third of participants work in the NICU (n=29; 33.0%) (Table 2). Table 1 details the participants' characteristics with Table 2 detailing the participants' unit classification.

Table 1: Participant characteristics (n = 37)

Participants' characteristics	**n**	**%**
Age range (years)		
20-29 years	3	8.1
30-39 years	16	43.2
40-49 years	11	29.7
50-59 years	5	13.5
60 years or older	2	5.4
Participants' professions		
Paediatrician	19	51.4
Neonatologist	5	13.5
Registered nurse	5	13.5
Physician	4	10.8
Physician in training: specialising in emergency medicine	1	2.7
Other (Child Nursing Specialist); community service doctor; paediatric subspecialist).	3	8.1
Province in which the participant works		
Gauteng	16	43.2
Western Cape	12	32.4
KwaZulu-Natal	4	10.8
North West	1	2.7
Eastern Cape	1	2.7
Free State	1	2.7
Limpopo	1	2.7
Mpumalanga	1	2.7
How many years of experience do you have working in the NICU and/or PICU?		
6 months to 1 year	2	5.4
1 to 2 years	1	2.7
3 to 5 years	6	16.2
6 to 10 years	14	37.8
More than 10 years	14	37.8
Years of experience as a specialised medical professional working with young children using High-Flow Nasal Cannula oxygen therapy		
6 months to 1 year	1	2.7
1 to 2 years	2	5.4
3 to 5 years	13	35.1
6 to 10 years	15	40.5
More than 10 years	6	16.2

Table 2: Participants' unit classification (n = 37)

Unit Classification (n=88) (where participants could select more than one option, which reflects a total of more than n=37 and percentages adding up to more than 100%)		
Neonatal Intensive Care Unit	29	33.0
Paediatric Ward	23	26.1
High Care Unit	18	20.5
Paediatric Intensive Care Unit	13	14.8
Emergency Unit	4	4.5
Other (Intensive Care Unit shared between all departments)	1	1.1

2.7 Materials and apparatus

An electronic survey (Appendix E) was compiled based on an existing survey developed by Canning et al. (2019), adapted to the South African context. It comprised 40 questions, including 39 closed-ended questions covering nominal scales, binary (Yes/No) questions, multiple-choice questions, and categorical options. Additionally, there was one open-ended question to collect qualitative data. A pilot study involved two staff from the Department of Speech-Language Pathology and Audiology and one doctor to review and assess the survey for clarity and comprehensibility (Brink et al., 2018). Feedback from pilot participants was used to include terminology relevant to the South African context. Additionally, the survey originally included three qualitative questions, but this was changed to include only one, to reduce the time it would take for participants to complete the survey.

2.8 Research procedures

2.8.1 Data collection

We advertised the study's infographic (Appendix G), along with the Qualtrics XM survey link, on the South African Paediatric Association's Facebook and X page, as well as on the South African Medical Association Facebook Page. Additionally, the infographic and link was shared on a WhatsApp group and distributed via email to our supervisors' networks and the researcher's personal contacts and mailing lists of specialised medical professionals such as paediatricians, neonatologists and registered nurses obtained from various professional websites, including the South

African Paediatric Association, South African Nursery Association (SANA), the Mediclinic website, the doctors involved in the Departments of Paediatrics and Child Health and the associated hospitals from the University of Pretoria, the University of the Witwatersrand, the University of Cape Town and Stellenbosch University, as well as the nurses involved in neonatal and paediatric care from the University of Pretoria and the University of Johannesburg.

Utilising an electronic survey enabled us to reach a broader population of possible participants across South Africa, collecting responses from all nine provinces except for the Northern Cape (Leedy & Ormrod, 2016). Upon clicking the survey link, participants received information describing the purpose of the research and the survey and provided their informed consent before beginning the survey (Appendix C). Three initial qualifying questions determined the participants' eligibility to participate as they had to select the following to proceed:

1) I am a medical professional (doctor or registered nurse)
2) I have a minimum of six months experience working with HFNC oxygen therapy in the paediatric population (within the last five years)
3) I confirm my informed consent to participate in this study

The survey included 40 self-administered questions which took participants approximately 10-15 minutes to complete. Participants could modify their answers and withdraw from the study before submission. Once they submitted, answers could not be altered and withdrawal from the study was no longer possible. These conditions were explained to participants on the information provided before they began the survey (Appendix A). Data collection spanned from 8 April 2024 to 13 May 2024, with the survey remaining open for five weeks.

2.8.2 Data analysis

The collected survey responses were downloaded from the Qualtrics-XM software and analysed using Microsoft Excel Version 2308. Descriptive statistics were used to summarise and describe the categorical data, both ordinal and nominal data collected on closed-ended, quantitative questions. This included measures such as frequency distributions, percentages, mean, median and mode, depicting the overall meaning of the responses (Brink et al., 2018).

For the qualitative component of our survey, which included a single open-ended question, we used content analysis to systematically evaluate and interpret the responses. This involved coding the data into categories and themes based on emergent patterns within the responses (Leedy & Ormrod, 2015). By identifying and interpreting these themes, we gained deeper insights into the participants' experiences and perspectives of oral feeding whilst using HFNC oxygen therapy, complementing the quantitative findings with context-specific information (Leedy & Ormrod, 2015).

2.9 Reliability and validity

The survey was conducted on an online forum, which allowed participants to answer the given questions anonymously, meaning the researcher’s influence was minimal, and therefore reduced researcher effect (Brink et al., 2018). The survey included the same standardised questions for each participant, which was based on a previously published survey by Canning et al. (2019).

Owing to the fact that the survey also provides qualitative data in the form of one open-ended question, procedures were included to ensure that the findings are accurate. Strategies recommended by Creswell (2013) in Brink et al. (2018) to ensure validity were used. These strategies included triangulation, peer debriefing as well as making detailed descriptions of the data. Researcher triangulation ensures validity as more than one researcher is involved in the study, whereas methodological triangulation ensures validity as both quantitative and qualitative methods are being used in the study (Brink et al., 2018). These methods were used to ensure that there is consistency across the study as well as between researchers.

3. Results

Thirty-seven participants were included in the sample. Among these, 28 participants (75.7%) provided opinions on their perspectives regarding oral feeding for infants/children receiving HFNC oxygen therapy. Twenty-four (64.9%) of the 37 responses were from private hospitals and 13 (35.1%) were from public hospitals, representing specialised medical professionals' views from six different hospital units.

Thirty-five participants (94.6%) reported that they use nCPAP and 34 participants (91.9%) reported using HFNC oxygen therapy. Thirty-six participants (97.3 %) reported on the definition of 'high flow' respiratory support (one missing response). HFNC oxygen therapy was defined as ≥2 L/min (n=15; 41.7%); L/kg (n=18; 50.0%); and 'other' (n=1; 2.8%).

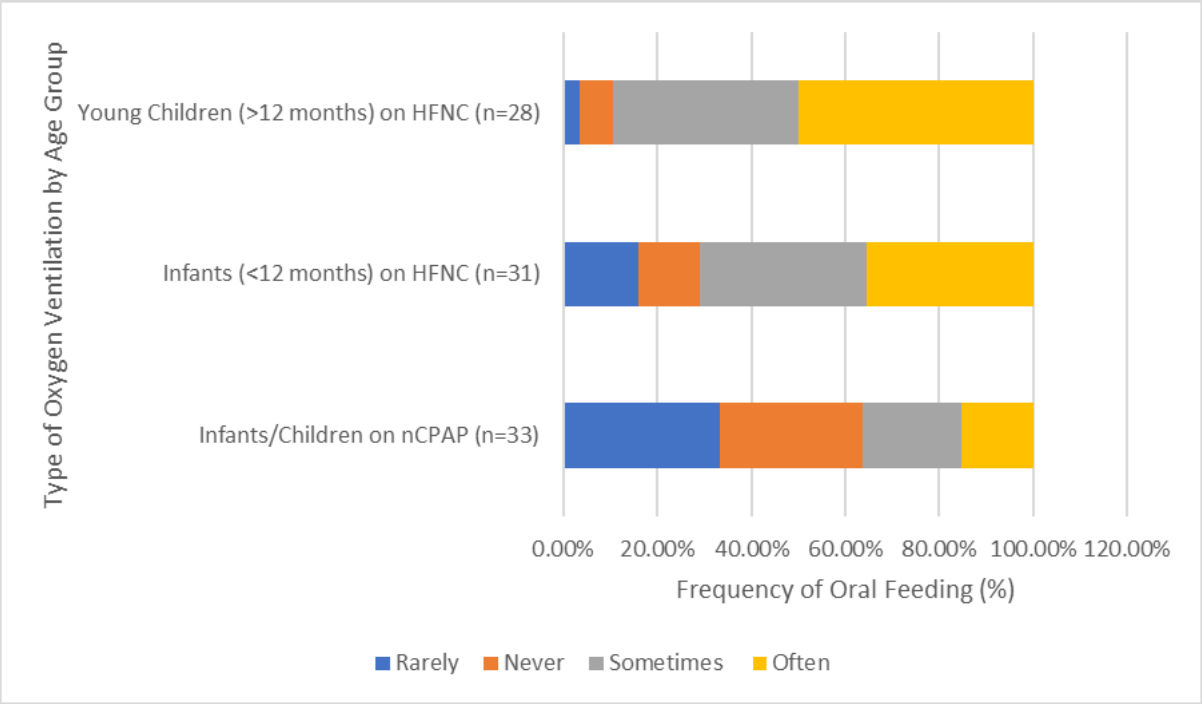
Of the participants that reported on the frequency of oral feeding, over half (63.6%; n=21) indicated they rarely or never feed young children on nCPAP. Twenty-five participants (89.3%) reported sometimes or often feeding young children older than 12 months on HFNC oxygen therapy. Figure 1 depicts the detailed frequencies of oral feeding on nCPAP versus HFNC oxygen therapy.

Twenty-eight (75.7%) qualitative responses were provided that revealed diverse opinions among participants regarding oral feeding on HFNC oxygen therapy. Two participants (7.1%) preferred *"not to feed orally while patients are on HFNC due to aspiration risk*" (Participant 35).

In contrast, the majority of the sample (n=17; 60.7%) supported early oral feeding on HFNC oxygen therapy. Some participants (n=8; 28.6%) emphasised its benefits and feasibility, noting it is usually *"well tolerated"* (Participant 17), *"better tolerated than on nCPAP, with fewer complications noted,"* (Participant 34) and that, *"most children tolerate the oral feeds better from coordination on high flow than nCPAP"* (Participant 31). This aligns with the quantitative findings. Some participants (n=10; 35.7%) acknowledged HFNC oxygen therapy's benefits, but also highlighted the need for

caution to consider the risk of aspiration and distress as reasons to delay or avoid oral feeding under certain conditions.

FIGURE 1: Frequency of oral feeding on nCPAP versus HFNC oxygen therapy (n=33)*



*The total number of participants varies for each question, reflecting differences in response rates (n=33, n=31, n=28), and percentages are calculated based on the number of responses for each specific question.

Participants indicated several reasons for not offering oral feeds to infants and young children receiving nCPAP and/or HFNC oxygen therapy. The most common reasons for both nCPAP (n=5; 50.0%) and HFNC oxygen therapy (n=1; 16.7%) were unclear risk of aspiration and the medical team's decision to not allow oral feeding for nCPAP (n=3; 30.0%) and HFNC oxygen therapy (n=1; 16.7%). Additionally, for infants on nCPAP, another reason was that infants are considered too young to begin oral feeding (n= 3; 10.0%).

Participants reported that infants and young children receiving nCPAP were fed mostly via syringe (n=12; 48.0%). Whereas, breastfeeding was the primary oral feeding method for both infants (n=22; 75.9%) and young children (n=22; 81.5%) on HFNC oxygen therapy, followed by bottle feeding with 74.1% (n=20) of young children

receiving HFNC oxygen therapy and 62.1% (n=18) of infants receiving HFNC oxygen therapy.

Participants minimally reported that infants were not orally fed while on nCPAP (n=4; 4.0%) and were rather receiving feeds through oro-gastric tubes (n=2; 8.0%) and nasogastric tubes (n=1; 4.0%). Table 4 details the oral feeding methods for infants receiving nCPAP and HFNC oxygen therapy.

Table 4: Oral feeding methods for infants receiving nCPAP and HFNC oxygen therapy (n=29)*

	Oral feeding for infants on nCPAP (n= 25)		**Oral feeding for infants on HFNC (n= 29)**		**Oral feeding for young children on HFNC (n=20)**	
	n	**%**	**n**	**%**	**n**	**%**
Syringe	12	48.0	15	51.7	11	40.7
Breastfeeding	9	36.0	22	75.9	22	81.5
Bottle feeding	8	32.0	18	62.1	20	74.1
Infant cup	6	24.0	13	44.8	14	51.9
Cup feeding	4	16.0	8	27.6	11	40.7
Solids	3	12.0	8	27.6	19	70.4

*Participants could select more than one option, which reflects a total of more than n=25 or n=32 and percentages adding up to more than 100%.

Thirty-four of 37 participants (91.9%) provided information about feeding services and assessment tools. Twenty-five of 34 participants (73.5%) reported having access to specialist feeding assessment and intervention services. Seventy-nine percent (24 of 37) of the participants have access to SLTs, ranging from daily availability to only on a referral basis. Thirteen of 34 participants (38.2%) reported using formal or informal feeding/swallowing assessment tools. Most participants did not specify tools or informal assessments they use, except for one who indicated using the Breastfeeding Assessment Score (BFAS). Twelve of 34 responses (35.3%) reported using instrumental swallowing evaluation, including videofluoroscopic swallow study

(VFSS)/modified barium swallow (MBS) (n=12; 35.3%), pulse oximetry (n=9; 26.5%), ultrasound (n=4; 11.8%), video-endoscopy (n=3; 8.8%), fiberoptic endoscopic evaluation of swallowing (FEES) (n=2, 5.9%), one (2.9%) using cervical auscultation, and one (2.9%) using pharyngeal manometry.

The most frequently employed strategies to support oral feeding (Table 5) reported for HFNC oxygen therapy were monitoring for clinical signs of aspiration (n=25; 78.1%), monitoring of physiological stability (n=22; 68.8%), and volume-limited feeds and positioning modifications (n=15; 46.9%). For nCPAP, the most frequently used strategies included monitoring of physiological stability (n=1; 64.3%) and volume-limited feeds and positioning modifications (n=14; 50.0%). Table 5 details the strategies employed to support oral feeding on nCPAP and HFNC oxygen therapy.

Table 5: Strategies employed to support oral feeding on nCPAP (n=28) and HFNC oxygen therapy (n=32)*

Strategy	nCPAP n=28 (%)	HNFC n=32 (%)
Monitoring for clinical signs of aspiration	13 (46.4)	25 (78.1)
Monitoring of physiological stability	18 (64.3)	22 (68.8)
Volume limited feeds	14 (50.0)	5 (46.9)
Positioning modifications	14 (50.0)	15 (46.9)
Specific criteria for respiratory stability are required (e.g. respiratory rate)	12 (42.9)	13 (40.6)
Time limited feeds	7 (25.0)	7 (21.9)
Respiratory support is reduced	6 (21.4)	3 (9.4)
Specific feeding equipment (e.g. type of teat)	3 (10.7)	1 (3.1)
None	2 (7.1)	3 (9.4)
Therapeutic tastes	0 (0.0)	1 (3.1)
Specific litres per minute (L/min) or litres per kilogram (L/kg)	0 (0.0)	6 (18.8)

*The total number of participants varies for each question, reflecting differences in response rates (n=28, n=32), and percentages are calculated based on the number of responses for each specific question. Participants could select more than one option, which reflects a total of more than n=28 or n=32 and percentages adding up to more than 100%.

HFNC: High-flow nasal cannula

nCPAP: Nasal continuous positive airway pressure

Most participants (n=15; 44.1%) reported that doctors alone would decide to commence or recommence oral feeding for infants and young children. Only nine participants (24.3%) indicated that speech-language therapists (SLTs) were involved in this decision. The qualitative data supported this finding. Two responses highlighted that feeding decisions are often made by the doctor based on their individual assessment during ward rounds or clinical evaluation. Two participants reported using a collaborative approach involving SLTs and nursing staff to make decisions. One participant (Participant 32) stated, *"Infants are assessed by speech therapy and fed if deemed to be ready*." and another said, *"I usually assess the child clinically in*

consultation with the nursing staff to decide if a child may be fed orally whilst on non-invasive support." (Participant 22).

Participants were then asked what criteria is used to assess infant/child oral feeding readiness (n=34). The most common criteria included cardiorespiratory stability (n=28; 82.4%), resolution/improvement of current illness (n=23; 67.6%), and age (n=20; 58.8%).

The majority (n=18; 64.3%) of the qualitative findings saw participants explaining that their decision-making is based on responding to individual patients' clinical cues such as distress levels, stability, the ability to maintain oxygen saturation during oral feeding and when patients show an appetite to feed as is attested to in the following quotes:

"the need for HFNC has never been a determinant in whether or not we initiate/continue with oral feeds. Oral feeds have rather been guided by clinical stability and maturity" (Participant 19).

"the degree of distress and the monitoring that is available" (Participant 4).

"infants able to adequately breathe and swallow without dropping oxygen saturations can be fed orally, provided they can maintain oxygen saturations and heart rate during feeding" (Participant 9).

"have to be monitored for aspiration." (Participant 10).

Another participant agreed, stating that *"if a patient is not severely distressed with no neurological disability, usually oral feeds are tolerated well. If severe distress, oral feeds are avoided for risk of aspiration as well as risk of intubation."* (Participant 11).

Common indicators to determine tolerance for oral feeding (n=32), included clinical signs of aspiration/laryngeal penetration (n=26; 81.3%), decrease in physiological stability (n=25; 78.1%), and organisation of sucking, swallowing and breathing (n=20; 62.5%). Other indicators included vomiting (n=2; 6.3%), or weight loss (n=1; 3.1%).

Thirty-two of 33 participants (97.0%) reported their units do not have a written policy or guideline that includes feeding method recommendations for infants/children receiving non-invasive respiratory supports (nCPAP, HFNC, LFNC). This was also reflected in the qualitative data, highlighting that this often leads to individualised and varied practices among medical professionals. One participant reported that *"[their] experience of oral feeding has been very haphazard and not guided by clinical evidence or formal guidelines,"* (Participant 21) while another reports that decisions are *"very individually based on the patient or physician"* (Participant 28).

Two participants described their self-selected procedures for managing oral feeding with consistent criteria as is detailed in the following:

"All these children are kept NPO (nil per os) for at least six hours after starting HFNC. Then feeds will be started if the baby is haemodynamically stable" (Participant 15).

"*Initially, a patient will be kept NPO. As the respiratory distress improves, feeding will be commenced orally. If the respiratory distress doesn't improve, oro-gastric feeds will be favoured in infants only"* (Participant 5).

4. Discussion

This survey of 37 specialised medical professionals revealed varied perspectives regarding oral feeding practices of infants and young children while on nCPAP versus HFNC oxygen therapy. This correlates with recent literature emphasising differing opinions on the safety of oral feeding with these oxygen therapies (Canning et al., 2019).

Many participants advocated for early oral feeding on HFNC oxygen therapy, noting benefits such as improved tolerance and reduced complications compared to nCPAP. However, others emphasised the need for caution when considering feeding on HFNC oxygen therapy, particularly surrounding risks of aspiration and patient distress, suggesting delays or avoiding oral feeding under certain conditions. Two participants specifically highlighted concern of potential aspiration risk, which may be linked to the limited research in this area causing complicated and cautious decision-making. While this approach is appropriate, further research is warranted to determine whether oral feeding can be safely implemented on HFNC oxygen therapy (Rice et al., 2022).

Participants have different views on when to withhold oral feeds. A greater concern about aspiration was associated with oral feeding on nCPAP (n=3; 30.0%) compared to HFNC oxygen therapy (n=1; 16.7%). The majority of participants (n=25; 89.0%) reported sometimes or often orally feeding infants and young children on HFNC oxygen therapy. In contrast, the greater half of participants (n=21; 63.6%) reported never or rarely initiating oral feeding of young children or infants while on nCPAP. Differences in feeding practices may reflect underlying physiological concerns. HFNC oxygen therapy increases pharyngeal pressures, possibly affecting laryngeal closure, pharyngeal sensory responses, and in turn, airway protection, while nCPAP is known to impact the timing and frequency of the swallowing reflex (Canning et al., 2019).

Infants and young children on nCPAP that were fed orally, were primarily fed via syringe while breastfeeding was most common for those on HFNC oxygen therapy with this finding likely relating to the age of the infants that participants work with. Syringe feeding with nCPAP may be driven by the desire to minimise aspiration risk, given the known impact on swallowing and the potential for silent aspiration (Dumpa

et al., 2020). In contrast, breastfeeding on HFNC oxygen therapy, could suggest a perceived lower risk of aspiration, despite its effect on pharyngeal pressures (Canning et al., 2019). Cresi et al. (2023) hypothesised that HFNC oxygen therapy may affect feeding intolerance to a lesser extent than nCPAP highlighting participants' perceived view that it may be the safer option for oral feeding infants and young children, although more evidence is required to support this view.

Decisions about introducing oral feeds are influenced by concerns, especially for patients on nCPAP. Participants appeared to often be concerned that infants might be too young for safe feeding initiation. Developing evidence-based guidelines is crucial to optimise patient outcomes while minimising potential risks. Thirty-two participants (97.0%) reported working in PICUs and NICUs without written guidelines on oral feeding recommendations for infants or young children receiving non-invasive respiratory support. This finding concurs with current research that states there are no such guidelines informing feeding decisions both in South Africa, and globally (Barnes et al., 2023; Canning et al., 2021; Charlton et al., 2022; Cresi et al., 2023; Hoosain et al., 2024; Raminick et al., 2020; Rice et al., 2022). Despite the lack of guidelines, participants reported using specific criteria such as cardiorespiratory stability, resolution/improvement of current illness, and age when deciding to initiate oral feeding. Indicators of readiness for oral feeding, such as clinical signs of aspiration/laryngeal penetration, decrease in physiological stability, organisation of sucking, swallowing and breathing, vomiting and weight loss were also used to guide decisions. These are indicated as known considerations for commencing oral feeding, justifying the medical professionals decision-making in this regard (Harding et al., 2018; Schoeman & Kritzinger, 2017). With 75.0% (n=28) of participants having six to 10 years or more working with this population, decisions are likely informed by clinical expertise, although less experienced medical professionals may benefit from established guidelines in a unit to inform decision making. Further research is thus required.

Tools that participants used in tandem with the criteria to guide decisions varied not only in availability, but also in use across participants. Not all participants had access to specialist feeding assessment and intervention services. Approximately a third

(n=12; 35.0%) of participants use instrumental swallowing evaluation, including VFSS/MBS, pulse oximetry, video-endoscopy, FEES, cervical auscultation and pharyngeal manometry. Similar results are indicated for the use of informal feeding/swallowing assessment tools (n=13; 38.2%). This agrees with global research indicating limited use of instrumental assessments for swallowing, which may be problematic as it is essential to determining the risk of silent aspiration and oral feeding safety (Canning et al., 2019; Hoosain et al., 2024). In the South African context, this may be due to a lack of material resources to conduct instrumental assessment across public and private sectors. The majority of rural hospitals do not have access to radiology equipment or services and need to refer to district or regional hospitals (Van Zyl et al., 2021). This variation underscores the absence of consistent guidelines for feeding assessment, as seen in other research (Bakker et al., 2021; Ghayum et al., 2022).

Decision-making regarding whether to commence or continue oral feeding for infants and young children on nCPAP or HFNC oxygen therapy is multifaceted. Participants indicated that unclear aspiration risk and medical team recommendations were the main reasons for withholding oral feeds. Aspiration concerns arose during both nCPAP use (n=5; 50.0%) and HFNC oxygen therapy (n=1; 16.7%). These concerns may stem from the lack of research on whether HFNC oxygen therapy potentially causes pharyngeal pressure, which may compromise airway protection, increase aspiration risk and disrupt the infant's suck, swallow and breathe coordination (Canning et al., 2021; Conway et al., 2021; Dodrill et al., 2016; Kalburgi et al., 2018; Raminick et al., 2020; Taha et al., 2016). Participants, with experience in the NICU (n=3; 10.0%), cited the infant's young age and immature suck-swallow-breathe coordination as further reasons for delaying oral feeding.

Another factor in withholding oral feeds was the medical team's decision, with doctors predominantly making these decisions independently (n=15; 44.1%). Only 24.3% (n=9) of participants reported involving SLTs to support with feeding decisions, despite the majority of the sample (n=34; 79.4%) having access to the services of SLTs either daily or on a referral basis at their facilities. Of the participants who refer to SLTs, six (66.7%) are working in the public sector with only three (33.3%) from the private sector,

collaborating with SLTs. In the private sector specifically, this could be owing to SLTs not being employed by the private hospital and thus present full-time, instead working on a referral basis. Most decisions are reportedly based on medical doctors' individual clinical evaluations and personal judgement during ward rounds, as supported by the study's qualitative findings. Participants noted that feeding decisions are guided by the infant's clinical cues such as the degree of distress, ability to maintain oxygen saturation, appetite for feeding, and overall stability during oral feeds. This is a patient-specific approach, based on the medical professionals' own clinical judgement. One of the participants, who stated that they make decisions in isolation, acknowledged that this inadvertently leads to haphazard decision making, which is not guided by evidence-based practice (Participant 23). Literature concurs, cautioning against specialised medical or allied healthcare professionals making feeding decisions in isolation.

Instead, a cautious and multidisciplinary approach where well-informed decisions are made holistically within a team to improve patient outcomes and enhance the safety of oral feeding is recommended (Conway et al., 2021; Kalburgi et al., 2018). SLTs, in particular, play an integral role in supporting feeding decisions by providing recommendations for this vulnerable population of infants and young children (Hoosain et al., 2024). Of those who did not mention collaborating with SLTs, only one participant provided a reason, attributing it to inadequate access to SLT services in a quaternary-level hospital, which is concerning. This finding aligns with that of Coutts (2019) as the SLT to patient ratio in South Africa is 1:18 000.

This study's findings possibly suggest that many South African specialised medical professionals may not always consider the value of SLTs in feeding assessment and intervention specifically for infants and young children receiving high-flow oxygen therapy. In response to this, SLTs should be encouraged to maintain a physical presence and be accessible in the PICU and NICU as without this, medical professionals may resort to managing these cases themselves. Furthermore, SLTs should advocate for their role, to encourage the utilisation of their input and skills in team-based decision making and practice.

Once the decision is made to commence oral feeding for infants and young children on HFNC oxygen therapy, participants recommended beginning cautiously with volume-limited oral feeds of specific consistencies with position modifications (n=15; 46.9%) while continuously monitoring for clinical signs of aspiration (n=25; 78.1%) and maintained physiological stability (n=22; 68.8%) to facilitate safer feeding of each patient, individually (Conway et al., 2021; Hoosain et al., 2024; Kalburgi et al., 2018). Approximately half of the participants apply similar strategies for supporting safe oral feeding in nCPAP use. Continuous monitoring enables prompt assessment of the infant's ability to handle oral feeds, allowing for timely interventions when necessary. The integration of multidisciplinary perspectives is essential in making these informed decisions. While doctors often lead the process, input from SLTs and nursing staff is invaluable, particularly in assessing feeding readiness and implementing strategies to ensure safety (Gelfer & McCarthy, 2015; Hoosain et al., 2024).

Limitations

The research study had several limitations. A limitation was the sample size of 37 participants. While the sample included perspectives from a broad geographical area, representing eight of the nine provinces, it still reflects a relatively small portion of South African specialised medical professionals which influences the generalisability of the findings. However, a strength of the study is that the majority of participants (n=28; 75.0%) had extensive experience, with six to 10 years or more in NICU or PICU settings. Findings are therefore based on knowledgeable and experienced medical professionals' opinions.

Future research

Future research may explore how decision-making varies based on the resources available in public versus private healthcare settings. Furthermore, the availability of speech-language therapy services as well as the lack of SLT referrals for oral feeding decisions in infants on high-flow oxygen therapy should be investigated. Studies should also focus on identifying the appropriate gestational age for initiating oral feeding, and the evaluation and development of current national guidelines and protocols for making oral feeding decisions in infants and young children on HFNC oxygen therapy and nCPAP.

5. Conclusion

This study highlights varied perspectives of specialised medical professionals on oral feeding of infants and young children on nCPAP and HFNC oxygen therapy in South Africa. Although there is concern regarding the safety of oral feeding on both oxygen therapies, HFNC oxygen therapy is often perceived as safer, although no clear evidence exists to confirm this. Decision-making around feeding remains complex and requires caution. Experienced specialised medical professionals often rely on their own clinical judgement and the infant or young child's physiological cues. However, less experienced specialised medical professionals may benefit from evidence-based guidelines and assessment tools to minimise potential risks and optimise outcomes for the patients. Access to instrumental assessments and SLT involvement is limited due to material and human resource constraints in the South African context, leading the medical specialists to predominantly make feeding decisions independently. This study is especially relevant to specialised medical professionals and SLTs in NICU and PICU settings. A cautious, multidisciplinary approach is recommended, with SLTs playing an active role by maintaining a consistent and accessible presence in NICUs and PICUs and contributing to the decision-making to ensure safe oral feeding practices for infants and young children on high-flow oxygen therapy.

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Appendices

APPENDIX A: Survey Cover Letter and Informed Consent Form

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APPENDIX A: Survey Cover Letter and Informed consent

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Dear prospective participant,

Title of study: To describe specialised medical professionals' perspectives on oral feeding practices of young children receiving high-flow oxygen

We hope this letter finds you well.

We are writing to invite you to participate in a study focused on understanding specialised medical professionals' perspectives on oral feeding practices of young children receiving high-flow oxygen. This letter aims to provide information to support you in making an informed decision regarding your participation in this research study.

We are conducting a survey study as part of our research in the completion of our undergraduate degree in BA Speech-Language Pathology at the University of Pretoria. Before implementing the survey, we will seek to obtain ethical approval for the research study from the Research Ethics Committee of the Faculty of Humanities, University of Pretoria.

By participating, your insights will contribute significantly to enhancing our understanding of oral feeding practices of young children receiving high-flow oxygen, an area currently lacking sufficient research. Our objective is to contribute to the expansion of the existing body of research on this topic, ultimately aiming to enhance research regarding best practice guidelines.

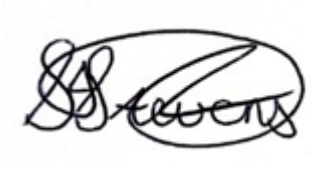
We extend the invitation to participate to specialised medical professionals, including junior doctors (training in paediatrics or emergency medicine), specialists (paediatricians, neonatologists, emergency specialists or physicians) and registered nurses, with a minimum of 6 months experience working with young children on high-flow oxygen and have knowledge of their feeding practices within the last 5 years in South Africa.

Your participation in this study will involve completing an online questionnaire which will take no longer than 15 minutes to complete. Participation in this study is entirely voluntary and you may opt to withdraw from the survey at any time before submission. You may return to and change previous questions before submitting it. The responses provided will remain confidential and private. This study's data will be analysed and reported in an academic research report and article and may be used for future research purposes. There are no anticipated risks or discomforts involved with participating.

Kindly be advised that checking the box below the information leaflet implies your consent to participate in this research study. Upon completing the survey, you will be notified that your answers will be recorded upon submission. Once submitted, your answers cannot be altered and withdrawal from the study will no longer be possible. Please answer all questions as honestly as possible.

Thank you for your valuable time and willingness to participate. If you know of any other specialised medical professional who may be interested in our study, please feel free to share this survey with them.

For any further information or inquiries, please do not hesitate to contact us at the following email address: u20424851@tuks.co.za
Sincerely,



Gabriela Lange
Researcher

Shanae Stevens
Researcher

Tatiana de Aguiar
Researcher

Claudia Lilje
Researcher

Mrs. Bhavani Pillay
Supervisor

Dr Esedra Krüger
Co-supervisor

Informed consent to participate in the study

I hereby confirm that I understand the process of the study.
I have also received, read and understood the relevant information pertaining to the study. I am aware of how the data obtained from the electronic survey will be gathered and used and will be kept strictly confidential.

I may withdraw my consent to participate in the study prior to the final submission of the survey. I am aware that I can change my answers prior to submission, but after submission has taken place, I can no longer withdraw from the study or change my answers. I have had an opportunity to ask questions, and I am prepared to take part in the study. I am aware that the results obtained may be used for future research.
A copy of this informed consent agreement can be provided upon my request.

I am a medical professional (doctor or registered nurse) ☐

I have a minimum of six months working with HFNC therapy in the paediatric population (in the last five years) ☐

I confirm my informed consent to participate in the study ☐

APPENDIX B: Social Media Permission

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100.
Since 1919

To whom it may concern,

We are undergraduate students at the University of Pretoria. The aim of our study is to describe South African specialised medical professional's perspectives on oral feeding practices of infants and young children receiving high-flow oxygen. An electronic survey is conducted to explore this topic and should not take more than 15 minutes to complete. We would like to ask permission to post an advert with the link to the survey on your group. All data collected will be strictly confidential. If you have any queries, please contact us at u20424851@tuks.co.za.

Yours sincerely

Mrs. Bhavani Pillay
Supervisor

Dr Esedra Krüger
Co-supervisor

Gabriela Lange
Researcher

Shanae Stevens
Researcher

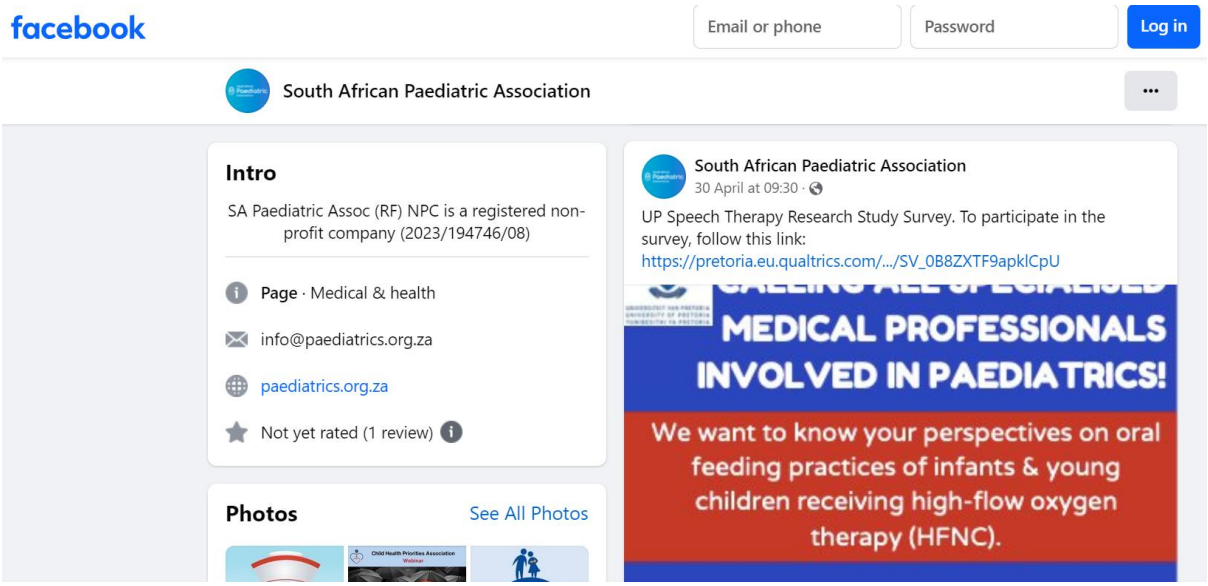
Tatiana de Aguiar
Researcher

Claudia Lilje
Researcher

I_____(full name of administrator) hereby give permission to post on the Facebook group _____(name) an advert with the electronic link to a survey for the purpose of an undergraduate research study at the University of Pretoria.

_____	_____	_____
Signature	Designation	Date

APPENDIX C: Consent to Advertise on Social Media



Request to share our UP Speech Therapy Research Study Survey on your Facebook Group External Inbox ×

Claudia Lilje <u19033827@tuks.co.za> 8 Apr 2024, 17:11
to Info@paediatrics.org.za

Good Day

I hope you are well.

I am a 4th year Student Speech Therapist from the University of Pretoria. We are currently doing our final year research on the perspectives of specialised medical professionals on oral feeding practices of infants and young children receiving high flow oxygen.

We wanted to inquire whether you would be willing to please share our study's information leaflet and link to our survey on your South African Paediatrics Association Facebook group? If so, please find attached our information leaflet and link to our survey.

The survey should take no longer than 10-15 minutes to complete and participants can withdraw from the survey at any stage before submitting.

Please find the link to our survey at: https://pretoria.eu.qualtrics.com/jfe/form/SV_0B8ZXTF9apklCpU

Thank you so much for your time and consideration, we appreciate it.

Kind Regards

Claudia Lilje

South African Paediatric Association 18 Apr 2024, 12:43
to me

Hi there Claudia,

We would be happy to share this on our Facebook page.

Kind regards,
Megan James

South African Paediatric Association
www.paediatrics.org.za

SA Paediatric Association (RF) NPC is a registered non-profit company (Registration number 2023 / 194746 / 08).

Striving for thriving kids

South African Paediatric Association 30 Apr 2024, 09:37 (13 days ago)
to me

Morning Claudia,

I have just posed it on our Facebook page as well as our Twitter page.

I hope that it helps.

Kind regards,
Megan James

South African Paediatric Association
www.paediatrics.org.za

SA Paediatric Association (RF) NPC is a registered non-profit company (Registration number 2023 / 194746 / 08).

Striving for thriving kids

Nileen Gale <nileeng@samedical.org> Wed, 31 Jan, 13:16
to me

Dear Gabriela,

I hope this email finds you well. Thank you for approaching SAMA with your request - we'd be happy to assist in sending this survey through to our paed members,

May I please ask for updated artwork to be shared with me, that includes the link and closing date?

Thank you

Kind Regards,
Nileen Gale
Specialist: Marketing and Communications
The South African Medical Association

APPENDIX D: Original Survey Questionnaire prior to pilot study

To describe specialised medical professionals' perspectives on oral feeding practices of infants and young children receiving high-flow oxygen

Section 1. Consent

*Q1. I consent to be part of this research study entitled Survey of Feeding Practices for Infants and Children Receiving High Flow Nasal Cannula (HFNC) Oxygen Therapy

- Yes
- No

Section 2. Demographics

*Q2. What is your age?

- 20-29 years
- 30-39 years
- 40-49 years
- 50-59 years
- 60 years or older

*Q3. Which province do you work in?

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

Q4. Which sector do you work in?

- Private healthcare
- Public healthcare

Q5. How is your unit classified as?

- Neonatal Intensive Care Unit (NICU) only
- Paediatric Intensive Care Unit (PICU)

- Paediatric ward
- Paediatric Inpatient Unit
- PICU and NICU (located together)
- Paediatric Burns Unit
- Transitional Care (High Care)
- Special Care Unit (SCN) only
- NICU and SCN (located together)
- Emergency Unit
- Other (please specify):

*Q6. What is your profession?

- Physician
- Physician training to specialise in emergency medicine
- Physician training to specialise in paediatric medicine
- Paediatrician
- Neonatologist
- Registered nurse
- Other (Specify)

Q7. How many years of experience do you have as a specialised medical professional?

- 6 months to 1 year
- 1 to 2 years
- 3 to 5 years
- 6 to 10 years
- More than 10 years

Q8. How many years of experience do you have as a specialised medical professional working with young children using High-Flow Nasal Cannula oxygen therapy?

- 6 months to 1 year
- 1 to 2 years
- 3 to 5 years
- 6 to 10 years
- More than 10 years

*Q9. What age group does your unit provide services to?

(Please tick all that apply):

- Preterm infants (<37 weeks gestational age)
- Neonates (0 to 1 month of age)

- Infants (1 to 12 months of age)
- Preschool age (1 to 5 years of age)
- School age (>5 to <18 years of age)

Q10. How many beds/cots in your unit?

Section 3. Nasal Continuous-Positive Airway Pressure (nCPAP)

*Q11. Is nasal continuous-positive airway pressure (nCPAP) * used in your unit?

- Yes
- No-skip to Q17

The following questions relate to the care of infants and children who receive nCPAP in your unit.

*Q12. Which nutrition therapy/routes of nutrition are used with infants and children receiving nCPAP in your unit?

(Please tick all that apply)

- Parenteral nutrition
- Orogastric-continuous
- Orogastric-bolus
- Nasogastric-continuous
- Nasogastric-bolus
- Oral feeding
- Other (please specify):

*Q13. Are infants/children who receive nCPAP fed orally?

- Often
- Sometimes
- Rarely
- Never

*Q14. Oral feeding methods for infants receiving nCPAP

(please tick all that apply):

- Breast feeding
- Bottle feeding
- Infant cup
- Syringe
- Cup (sipper/straw/open cup)

- Solids
- Other (please specify):

*Q15. Are there any restrictions to food textures or fluid consistencies provided to infants/children receiving nCPAP?

- No
- Yes (please specify):

*Q16. Please indicate which fluid consistencies and food textures are allowed to infants/children receiving nCPAP in your unit:

- Thin fluids
- Thickened fluids
- Purees
- Lumpy mashed foods
- Minced and moist foods
- Chewable foods
- All of the above

*Q17. What strategies are employed while the infant/child receiving nCPAP is feeding orally? (please tick all that apply)

- Volume limited feeds
- Time limited feeds
- Monitoring of physiological stability
- Respiratory support is reduced
- Specific criteria for respiratory stability are required (e.g.respiratory rate)
- Specified pressure (cmH2O)
- Monitoring for clinical signs of aspiration
- Positioning modifications
- Therapeutic tastes
- Specific feeding equipment (e.g. type of teat)
- None
- Other (please specify)

*Q18. Who provides the oral feeds to the infants/children receiving nCPAP? (please tick all that apply):

- Parents/carers
- Nursing staff
- Speech pathologist/therapist
- Occupational therapist
- Other (please specify):

Section 4. High Flow Nasal Cannula oxygen therapy (HFNC)

*Q19. Is high-flow nasal cannula (HFNC) respiratory support used in your unit?

- Yes
- No-skip to Q18

The following questions related to the care of infants and children receiving high-flow nasal cannula (HFNC) respiratory support in your unit:

*Q20. How does your unit define high flow?

- 1 or more litres per minute (>1 L/min)
- 2 or more litres per minute (>2 L/min)
- Litres per kilogram (L/kg)
- Unsure
- Other (please specify):

*Q21. Which nutrition support therapy/routes of nutrition are used with infants/children receiving HFNC in your unit (please tick all that apply):

- Parental nutrition
- Orogastric-continuous
- Orogastric-bolus
- Nasogastric-continuous
- Nasogastric-bolus
- Oral feeding
- Other (please specify)

*Q22. Are infants (<12 months old) who are receiving HFNC, fed orally?

- Often
- Sometimes
- Rarely
- Never

*Q23. Oral feeding methods for infants (<12 months old) receiving HFNC
(please tick all that apply):

- Breastfeeding
- Bottle feeding
- Infant cup
- Syringe
- Cup (sipper/straw/open cup)

- Solids
- Other (please specify)

*Q24. Are young children (>12 months old) who are receiving HFNC, fed orally?

- Often
- Sometimes
- Rarely
- Never

*Q25. Oral feeding methods for young children (>12 months old) receiving HFNC
(please tick all that apply):

- Breastfeeding
- Bottle feeding
- Infant cup
- Syringe
- Cup (sipper/straw/open cup)
- Solids
- Other (please specify)

*Q26. Are there any restrictions to food textures or fluid consistencies provided to infants/children receiving HFNC?

- Yes
- No

*Q27. Please indicate which food textures and fluid consistencies are allowed to infants/children receiving HFNC in your unit
(please tick all that apply):

- Thin fluids
- Thickened fluids
- Purees
- Lumpy mashed foods
- Minced and moist foods
- Chewable foods
- All of the above

*Q28. What specific strategies are employed while the infant/child receiving HFNC is feeding orally (please tick all that apply):

- Volume limited feeds

- Time limited feeds
- Monitoring of physiological stability
- Respiratory support is reduced
- Specific criteria for respiratory stability are required (e.g. respiratory rate)
- Specific litres per minute (L/min) or litres per kilogram (L/kg)
- Monitoring for clinical signs of aspiration
- Positioning modifications
- Therapeutic tastes
- Specific feeding equipment (e.g. type of teat)
- None
- Other (please specify):

*Q29. Who provides the oral feeds to the infants/children receiving HFNC?
(please tick all that apply):

- Parents/guardians
- Nursing staff
- Speech Language Pathologist/Therapist
- Occupational Therapist
- Other (please specify):

Section 5. No oral feeding on nCPAP

*Q30. If you replied *no* to the question 'Are infants/children who are receiving nCPAP in your unit fed orally?', please tell us why
(tick all that apply):

- Medical team do not allow
- Aspiration risk is unclear
- Infants are too young to commence oral feeding
- Not applicable
- Other (please specify):

Section 6. No oral feeding on HFNC

*Q31. If you replied *no* to the question 'Are infants/children who are receiving HFNC in your unit fed orally?', please tell us why
(tick all that apply):

- Medical team do not allow
- Aspiration risk is unclear

- Infants are too young to commence oral feeding
- Not applicable
- Other (please specify):

Section 7. Feeding Management

*Q32. Who decides when oral feeding is commenced/recommended for infants/children in your unit? (Please tick all that apply):

- Medical officer
- Nursing staff
- Speech Language Pathologist/Therapist
- Occupational Therapist
- Parent/guardian
- Team decision
- Other (please specify):

*Q33. What are the criteria/tools used to assess infant/ child readiness for oral feeding? (Please tick all that apply):

- Age
- Weight
- No longer on nCPAP
- No longer on HFNC
- Cardiorespiratory stability
- Resolution/improvement of current illness
- Observation of feeding readiness cues
- Specific flow rate (L/min, L/kg, cmH2O)
- Workplace guidelines
- Oral feeding readiness tool (please specify details below)
- Other (please specify):

*Q34. Does your unit have a written policy or guideline that includes feeding method recommendations for infants/children receiving non-invasive respiratory supports (nCPAP, HFNC, LFNC)?

- Yes
- No

*Q35. If you answered yes to the above question, can you please share this document with us?(Not for distribution, for our information only)

Please upload your document here.

*Q36. Are specialist feeding assessment and intervention services provided in your unit?

- No
- Yes

How many days per week?

*Q37. Who provides specialist feeding assessment and intervention services in your unit?

- Speech Language Pathologist/Therapist
- Occupational Therapist
- Other (please specify):

Q38. Is the feeding therapist referring to infants/children who are receiving HFNC to assess oral feeding readiness and safety?

- Yes
- No
- Not applicable

Q39. Are formal or informal oral feeding evaluation tools used in your unit to assess oral sensorimotor, feeding and swallowing function/competence?

- No
- Yes (please specify):

Q40. Is instrumental evaluation of the swallow used to assess swallow safety for infants/children in your unit?

- No
- Yes

(please tick all that apply):

- Videofluoroscopic swallow study (VFSS) or modified barium swallow (MBS)
- Fiberoptic endoscopic evaluation of swallowing (FEES)
- Pharyngeal manometry
- Cervical auscultation
- Pulse oximetry
- Video-endoscopy
- Ultrasound
- Other (please specify):

Q41. What indicators are used to determine if the infant/ child is not tolerating an oral feed? (Please tick all that apply):

- Decrease in physiological stability
- Behavioural cues
- Clinical signs of aspiration or laryngeal penetration
- Changes in state
- Organisation of sucking, swallowing and breathing
- None
- Other (please specify):

*Q42. In your unit, are there any differences of opinion between staff regarding feeding practices for infants/children receiving nCPAP or HFNC?

- No
- Yes (please elaborate):

*Q43. Briefly describe your experiences and/or perspectives on oral feeding infants/children receiving HFNC?

*Q44. Do you think there are inconsistent practices regarding oral feeding safety while infants/children are receiving HFNC?

Q45. What suggestions do you have to improve these practices?

Thank you for taking the time to complete this survey.

APPENDIX E: Survey Questionnaire

Specialised medical professionals' perspectives on oral feeding practices of infants on HFNC

Start of Block: Section 1. Consent

Q1 Title of study: Specialised medical professionals' perspectives on oral feeding practices of young children receiving high-flow oxygen.

Dear prospective participant,

We invite you to participate in a study focused on understanding specialised medical professionals' perspectives on oral feeding practices of infants and young children receiving high-flow oxygen. We are conducting a survey study as part of our research in the completion of our undergraduate degree in BA Speech-Language Pathology at the University of Pretoria.

Ethical clearance for the research study has been granted by the Research Ethics Committee of the Faculty of Humanities, University of Pretoria. By participating, your insights will contribute significantly to enhancing our understanding of oral feeding practices of infants and young children receiving high-flow oxygen, an area currently lacking sufficient research. Our objective is to contribute to the expansion of the existing body of research on this topic, ultimately aiming to enhance research regarding best practice guidelines.

We extend the invitation to participate to specialised medical professionals, such as **registrars, consultants and fellows** (training in paediatrics or emergency medicine), **specialists** (paediatricians, neonatologists, emergency specialists or physicians) and **registered nurses**. Applicants should have a minimum of 6 months experience working with infants and young children on high-flow oxygen, with knowledge of their feeding practices within the last 5 years in South Africa.

Your participation in this study will involve completing an online questionnaire which will take no longer than 15 minutes to complete. Participation in this study is entirely voluntary and you may opt to withdraw from the survey at any time before submission. You may return to and change previous questions before submitting it. The responses provided will remain confidential and private. This study's data will be analysed and reported in an academic research report and article and may be used for future research purposes. There are no anticipated risks or discomforts involved with participating.

Kindly be advised that checking the box below implies your consent to participate in this research study. Upon completing the survey, you will be notified that your answers will be recorded upon submission. Once submitted, your answers cannot be altered and withdrawal from the study will no longer be possible. Please answer all questions as honestly as possible.

Thank you for your valuable time and willingness to participate. If you know of any other specialised medical professionals who may be interested in our study, please feel free to share this survey with them.

For any further information or inquiries, please do not hesitate to contact us at the email address provided below. Sincerely,
Tatiana de Aguiar, Gabriela Lange, Shanae Stevens and Claudia Lilje
u20424851@tuks.co.za

Supervisors: Mrs. Bhavani Pillay (bhavani.pillay@up.ac.za)
Dr Esedra Krüger (esedra.krüger@up.ac.za)

Informed consent to participate in the study

I hereby confirm that I understand the process of the study. I have also received, read and understood the relevant information pertaining to the study. I am aware of how the data obtained from the electronic survey will be gathered and used and will be kept strictly confidential.

I may **withdraw my consent** to participate in the study prior to the final submission of the survey. I am aware that I can change my answers prior to submission, but after submission has taken place, I can **no longer withdraw** from the study or change my answers. I have had an opportunity to ask questions, and I am prepared to take part in the study. I am aware that the results obtained may be used for future research.

A copy of this informed consent agreement can be provided upon my request.

- ▢ I am a medical professional (doctor or registered nurse)
- ▢ I have a minimum of six months experience working with HFNC therapy in the paediatric population (within the last five years)
- ▢ I confirm my informed consent to participate in the study

End of Block: Section 1. Consent

Start of Block: Section 2. Demographics

Q2 What is your age?

- o 20-29 years
- o 30-39 years
- o 40-49 years
- o 50-59 years

o 60 years or older

Q3 Which province do you work in?

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

Q4 Which sector do you work in?

o Private healthcare
o Public healthcare

Q5 How is the unit you are currently working in classified? (Please tick all that apply)

☐ Neonatal Intensive Care Unit (NICU)
☐ Paediatric Intensive Care Unit (PICU)
☐ Paediatric Ward
☐ Paediatric Burns Unit
☐ High Care Unit
☐ Emergency Unit
☐ Other (please specify): _____

Q6 What is your profession?

o Physician
o Physician in training: specialising in emergency medicine
o Physician in training: specialising in paediatric medicine
o Physician in training: specialising in neonatal medicine
o Paediatrician
o Neonatologist
o Registered nurse
o Other (please specify): _____

Q7 How many years of experience do you have working in the NICU and/or PICU?

o 6 months to 1 year
o 1 to 2 years
o 3 to 5 years

o 6 to 10 years
o More than 10 years

Q8 How many years of experience do you have as a specialised medical professional working with young children using High-Flow Nasal Cannula oxygen therapy?
o 6 months to 1 year
o 1 to 2 years
o 3 to 5 years
o 6 to 10 years
o More than 10 years

Q9 What age group does your unit provide services to? (Please tick all that apply)
▢ Preterm infants (<37 weeks gestational age)
▢ Neonates (0 to 1 month of age)
▢ Infants (1 to 12 months of age)
▢ Preschool age (1 to 5 years of age)
▢ School age (>5 to <18 years of age)

End of Block: Section 2. Demographics
Start of Block: Section 3. Nasal Continuous-Positive Airway Pressure (nCPAP)

Q10 Is nasal continuous-positive airway pressure (nCPAP) used in your unit?
o Yes
o No

Skip To: End of Block If Is nasal continuous-positive airway pressure (nCPAP) used in your unit? = No

Q11 Which nutrition therapy/routes of nutrition are used with infants and children receiving nCPAP in your unit? (Please tick all that apply)
▢ Parenteral nutrition
▢ Orogastric-continuous
▢ Orogastric-bolus
▢ Nasogastric-continuous
▢ Nasogastric-bolus
▢ Oral feeding
▢ Other (please specify): _____

Q12 Are infants/children who receive nCPAP fed orally?
o Often
o Sometimes

o Rarely
o Never

Q13 Oral feeding methods for infants receiving nCPAP (please tick all that apply):

☐ Breastfeeding
☐ Bottle feeding
☐ Infant cup
☐ Syringe
☐ Cup (sipper/straw/open cup)
☐ Solids
☐ Other (please specify): _____

Q14 Are there any restrictions to food textures or fluid consistencies provided to infants/children receiving nCPAP?

o Yes (please specify): _____
o No

Q15 Please indicate which fluid consistencies and food textures are allowed to infants/children receiving nCPAP in your unit:

☐ Thin fluids
☐ Thickened fluids
☐ Purees
☐ Lumpy mashed foods
☐ Minced and moist foods
☐ Chewable foods
☐ All of the above

Q16 What strategies are employed while the infant/child receiving nCPAP is feeding orally? (please tick all that apply)

☐ Volume limited feeds
☐ Time limited feeds
☐ Monitoring of physiological stability
☐ Respiratory support is reduced
☐ Specific criteria for respiratory stability is required (e.g. respiratory rate)
☐ Specified pressure (cmH2O)
☐ Monitoring for clinical signs of aspiration
☐ Positioning modifications
☐ Therapeutic tastes
☐ Specific feeding equipment (e.g. type of teat)
☐ None

☐ Other (please specify): _____

Q17 Who provides the oral feeds to the infants/children receiving nCPAP? (please tick all that apply):

☐ Parents/guardians
☐ Nursing staff
☐ Speech pathologist/therapist
☐ Occupational therapist
☐ Other (please specify): _____

End of Block: Section 3. Nasal Continuous-Positive Airway Pressure (nCPAP)
Start of Block: Section 4. High Flow Nasal Cannula oxygen therapy (HFNC)

Q18 Is high-flow nasal cannula (HFNC) oxygen therapy respiratory support used in your unit?

o Yes
o No

Skip To: End of Block If Is high-flow nasal cannula (HFNC) oxygen therapy respiratory support used in your unit? = No

Q19 The following questions are related to the care of infants and children receiving high-flow nasal cannula (HFNC) respiratory support in your unit:

How does your unit define high flow?

o 1 or more litres per minute (>1 L/min)
o 2 or more litres per minute (>2 L/min)
o Litres per kilogram (L/kg)
o Unsure
o Other (please specify): _____

Q20 Which nutrition support therapy/routes of nutrition are used with infants/children receiving HFNC in your unit (please tick all that apply):

☐ Parental nutrition
☐ Orogastric-continuous
☐ Orogastric-bolus
☐ Nasogastric-continuous
☐ Nasogastric-bolus
☐ Oral feeding
☐ Other (please specify): _____

Q21 Are infants (<12 months old) who are receiving HFNC, fed orally?

o Often
o Sometimes
o Rarely
o Never

Q22 Oral feeding methods for infants (<12 months old) receiving HFNC (please tick all that apply):

☐ Breastfeeding
☐ Bottle feeding
☐ Infant cup
☐ Syringe
☐ Cup (sipper/straw/open cup)
☐ Solids
☐ Other (please specify)

Q23 Are young children (> 12 months old) who are receiving HFNC, fed orally?

o Often
o Sometimes
o Rarely
o Never

Q24 Oral feeding methods for young children (>12 months old) receiving HFNC (please tick all that apply):

☐ Breastfeeding
☐ Bottle feeding
☐ Infant cup
☐ Syringe
☐ Cup (sipper/straw/open cup)
☐ Solids
☐ Other (please specify): _____

Q25 Are there any restrictions to food textures or fluid consistencies provided to infants/children receiving HFNC?

o Yes (please specify): _____
o No

Q26 Please indicate which food textures and fluid consistencies are allowed to infants/children receiving HFNC in your unit (please tick all that apply):

☐ Thin fluids
☐ Thickened fluids

- ☐ Purees
- ☐ Lumpy mashed foods
- ☐ Minced and moist foods
- ☐ Chewable foods
- ☐ All of the above

Q27 What specific strategies are employed while the infant/child receiving HFNC is feeding orally? (please tick all that apply):

- ☐ Volume limited feeds
- ☐ Time limited feeds
- ☐ Monitoring of physiological stability
- ☐ Respiratory support is reduced
- ☐ Specific criteria for respiratory stability is required (e.g. respiratory rate)
- ☐ Specific litres per minute (L/min) or litres per kilogram (L/kg)
- ☐ Monitoring for clinical signs of aspiration
- ☐ Positioning modifications
- ☐ Therapeutic tastes
- ☐ Specific feeding equipment (e.g. type of teat)
- ☐ None
- ☐ Other (please specify): _____

Q28 Who provides the oral feeds to the infants/children receiving HFNC? (please tick all that apply):

- ☐ Parents/guardians
- ☐ Nursing staff
- ☐ Speech Language Pathologist/Therapist
- ☐ Occupational Therapist
- ☐ Other (please specify): _____

End of Block: Section 4. High Flow Nasal Cannula oxygen therapy (HFNC)

Start of Block: Section 5. No oral feeding on nCPAP

Display This Question:

If 'Are infants/children who receive nCPAP fed orally?' = Never

Q29 If you replied no to the question 'Are infants/children who are receiving nCPAP in your unit fed orally?', please tell us why (tick all that apply):

- ☐ Medical team do not allow
- ☐ Aspiration risk is unclear
- ☐ Infants are too young to commence oral feeding
- ☐ Not applicable
- ☐ Other (please specify): _____

End of Block: Section 5. No oral feeding on nCPAP

Start of Block: Section 6. No oral feeding on HFNC

Display This Question:

If 'Are young children (12 months old) who are receiving HFNC, fed orally?' = Never

Q30 If you replied no to the question 'Are infants/children who are receiving HFNC in your unit fed orally?', please tell us why (tick all that apply):

- ☐ Medical team do not allow
- ☐ Aspiration risk is unclear
- ☐ Infants are too young to commence oral feeding
- ☐ Not applicable
- ☐ Other (please specify): _____

End of Block: Section 6. No oral feeding on HFNC

Start of Block: Section 7. Feeding Management

Q31 Who decides when oral feeding is commenced/recommended for infants/children in your unit? (Please tick all that apply):

- ☐ Doctor
- ☐ Nursing staff
- ☐ Speech Language Pathologist/Therapist
- ☐ Occupational Therapist
- ☐ Parent/guardian
- ☐ Team decision
- ☐ Other (please specify): _____

Q32 What are the criteria/tools used to assess infant/ child readiness for oral feeding? (Please tick all that apply):

- ☐ Age
- ☐ Weight
- ☐ No longer on nCPAP
- ☐ No longer on HFNC
- ☐ Cardiorespiratory stability
- ☐ Resolution/improvement of current illness
- ☐ Observation of feeding readiness cues
- ☐ Specific flow rate (L/min, L/kg, cmH2O)
- ☐ Workplace guidelines
- ☐ Oral feeding readiness tool (please specify details below):

_____

▢ Other (please specify): _____

Q33 Does your unit have a written policy or guideline that includes feeding method recommendations for infants/children receiving non-invasive respiratory supports (nCPAP, HFNC, LFNC)?

o Yes (If so, please type the name of the policy or guideline)

_____

o No

Q34 Are specialist feeding assessment and intervention services provided in your unit?

o Yes (How many days per week?)

_____

o No

Q35 Who provides specialist feeding assessment and intervention services in your unit?

o Speech Language Pathologist/Therapist

o Occupational Therapist

o Other (please specify): _____

Q36 Are formal or informal oral feeding evaluation tools used in your unit to assess oral sensorimotor, feeding and swallowing function/competence?

o Yes (please specify): _____

o No

o Unsure

Q37 Is instrumental evaluation of swallowing used to assess swallow safety for infants/children in your unit?

For example, instrumental evaluation may include videofluoroscopic swallow study (VFSS), fiberoptic endoscopic evaluation of swallowing (FEES), pharyngeal manometry, cervical auscultation, pulse oximetry, video-endoscopy and/or ultrasound.

o Yes

o No

o Unsure

Display This Question:

If 'Is instrumental evaluation of swallowing used to assess swallow safety for infants/children in yo…' = Yes

Q38 If you answered yes to the above question, can you please select all that apply:

▢ Videofluoroscopic swallow study (VFSS) or modified barium swallow (MBS)

▢ Fibreoptic endoscopic evaluation of swallowing (FEES)

- ☐ Pharyngeal manometry
- ☐ Cervical auscultation
- ☐ Pulse oximetry
- ☐ Video-endoscopy
- ☐ Ultrasound
- ☐ Other (please specify): _____

Q39 What indicators are used to determine if the infant/child is not tolerating an oral feed? (Please tick all that apply):

- ☐ Decrease in physiological stability
- ☐ Behavioural cues
- ☐ Clinical signs of aspiration or laryngeal penetration
- ☐ Changes in state
- ☐ Organisation of sucking, swallowing and breathing
- ☐ None
- ☐ Other (please specify): _____

Q40 **Final Question**: Briefly describe your experiences and/or perspectives on oral feeding infants/children receiving HFNC?

APPENDIX F: Participant Information Leaflet

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100. Since 1919

Study title: Specialised medical professionals' perspectives on oral feeding practices of infants and young children receiving high-flow oxygen

Contact details: u20424851@tuks.co.za

Dear Colleague,

We are conducting this survey as part of our undergraduate degree in BA Speech-Language Pathology at the University of Pretoria. If you have a minimum of 6 months of experience, in the past 5 years working in or rendering services to a neonatal or paediatric unit where high flow oxygen is being provided to the paediatric population, you are invited to participate in the study. Participation in the study is entirely voluntary and you are free to withdraw at any time **prior** to the submission of the survey.

What is the purpose of the study?

The current understanding of specialised medical professionals' perspective on oral feeding practices of neonates and young children receiving HFNC oxygen therapy is limited, with an evident lack of research and guidelines. The gap in knowledge surrounding the safety of oral feeding whilst on HFNC oxygen therapy poses a challenge for medical professionals needing to make decisions about the management of neonates and young children receiving HFNC oxygen therapy in the NICU and PICU. The differing perspectives among medical professionals surrounding the oral feeding safety of infants and young children creates potentially inconsistent practices and highlights the need for obtaining views from specialised medical professionals' experiences and concerns surrounding the topic. The aim of the study is to describe South African specialised medical professionals' perspectives regarding oral feeding practices of infants and young children receiving high-flow oxygen.

Explanation of what is expected from participants

Prospective participants will be sent a link to the online survey through various medical professional Facebook and social media groups. Specialised medical professionals including physicians (junior and senior in paediatrics and emergency medicine), paediatricians, neonatologists and registered nurses who have experience with oral feeding of infants/children receiving HFNC in South Africa are invited to participate. Completion of the online survey is self-administered and should take 20 minutes to complete. Changes can be made to answers and participants may withdraw from the study at any time before submission. However, once the survey has been submitted, answers cannot be changed and withdrawal from the study is no longer possible. Responses will be collated and used in a research report and academic article. Answers should be reported as honestly as possible. Participants are able to share the link to the survey to other specialised medical professionals who fit the inclusion criteria and may be interested in participating in the study.

Ethical approval

Ethical approval for the study will be obtained from the Research Ethics Committee of the Faculty of Humanities, University of Pretoria. The study has been guided by the Declaration of Helsinki which aims to protect human participants in research. A copy of the declaration can be obtained online or through request from the researchers Tatiana de Aguiar, Gabriela Lange, Shanae Stevens and Claudia Lilje.

What are your rights if you take part?

You have the right to voluntarily participate and withdraw from the study without consequence. No compensation for participating in the study is provided.

What are the risks involved in the procedures?

Participants will not be harmed in any way from participating in the study. All information recorded will be kept confidential.

Confidentiality

All information gathered will be strictly confidential. Data will be reported in a research report and an academic journal article and will not include any identifiable information about participants. Data will be stored on a password-protected computer; a hard copy will be stored for 15 years in a secure room in the Department of Speech-Language Pathology and Audiology in accordance with the University of Pretoria's guidelines. Data may be used for future research.

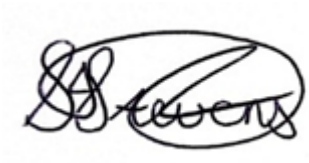
Queries

If you have any further questions about the research, please feel free to contact the researchers Tatiana de Aguiar, Gabriela Lange, Shanae Stevens and Claudia Lilje (u20424851@tuks.co.za). Alternatively, you can contact the supervisors Mrs. Bhavani Pillay at bhavani.pillay@up.ac.za and Dr Esedra Krüger at esedra.kruger@up.ac.za.

Mrs. Bhavani Pillay
Supervisor

Dr Esedra Krüger
Co-supervisor

Gabriela Lange
Researcher



Shanae Stevens
Researcher

Tatiana de Aguiar
Researcher

Claudia Lilje
Researcher

Dear Prospective Participant,

We invite you to please take part in our survey as part of our undergraduate degree in BA Speech-Language Pathology at the University of Pretoria.

The aim of our study is to describe **South African specialised medical professional's perspectives regarding oral feeding practices of infants and young children receiving high-flow oxygen**. This is important as the current understanding of this topic is limited, with an evident lack of research and guidelines posing a challenge for medical professionals needing to make decisions about the management of neonates and young children receiving HFNC oxygen therapy in the NICU and PICU.

We extend the invitation to participate to specialised medical professionals, such as registrars, consultants and fellows (training in paediatrics or emergency medicine), specialists (paediatricians, neonatologists, emergency specialists or physicians) and registered nurses. If you have a minimum of 6 months of experience, in the past 5 years working in or rendering services to a neonatal or paediatric unit where high flow oxygen is being provided to the paediatric population, you are invited to participate in the study. Participation in the study is entirely voluntary and you are free to withdraw at any time **prior** to the submission of the survey. The survey should not take more than 15 minutes to complete. All data collected will be strictly confidential.

Please find the link to our survey at:
https://pretoria.eu.qualtrics.com/jfe/form/SV_0B8ZXTF9apklCpU

Thank you so much for your participation, it is much appreciated. Please feel free to share this survey with your colleagues.

If you have any queries, please contact us at u20424851@tuks.co.za.
Yours sincerely

Tatiana de Aguiar, Claudia Lilje, Shanae Stevens and Gabriella Lange

Supervisors: Mrs. Bhavani Pillay at bhavani.pillay@up.ac.za and Dr Esedra Krüger at esedra.kruger@up.ac.za.

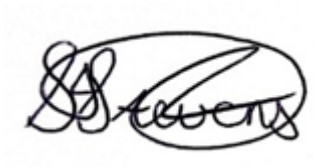
Queries

If you have any further questions about the research, please feel free to contact the researchers Tatiana de Aguiar, Gabriela Lange, Shanae Stevens and Claudia Lilje (u20424851@tuks.co.za). Alternatively, you can contact the supervisors Mrs. Bhavani Pillay at bhavani.pillay@up.ac.za and Dr Esedra Krüger at esedra.kruger@up.ac.za.

Mrs. Bhavani Pillay
Supervisor

Dr Esedra Krüger
Co-supervisor

Gabriela Lange
Researcher



Shanae Stevens
Researcher

Tatiana de Aguiar
Researcher

Claudia Lilje
Researcher

APPENDIX G: Survey Advertisement for Social Media Platforms

UNIVERSITEIT VAN PRETORIA
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YUNIBESITHI YA PRETORIA

CALLING ALL SPECIALISED MEDICAL PROFESSIONALS INVOLVED IN PAEDIATRICS!

We want to know your perspectives on oral feeding practices of infants & young children receiving high-flow oxygen therapy (HFNC).

WHO CAN PARTICIPATE?

- Junior Doctors training in: Paediatrics/ Emergency Medicine
- Specialised Physicians
- Paediatricians
- Neonatologists
- Emergency Specialists
- Registered Nurses
- Registered with HPCSA.
- Currently employed in South Africa.
- Work experience: a MINIMUM of 6 MONTHS' experience working with the paediatric population, in NICUs & PICUs, in the last 5 YEARS.

SURVEY PERIOD: APRIL-MAY 2024

WHAT DO YOU NEED TO DO?

1) Click on link.
2) Submit your consent to participate.
3) Answer the questions in the survey.

Only 15 minutes to complete!

*You can choose to participate in this survey.
*Participants can end the survey at any given time before submitting & not be forced to complete it.
*Participants remain anonymous.
*Responses remain confidential and for research purposes only.

Follow this link to complete the survey:
https://pretoria.eu.qualtrics.com/jfe/form/SV_0B8ZXTF9apklCpU

For any inquiries contact:
Supervisors: Mrs Bhavani Pillay (bhavani.pillay@up.ac.za)/
Dr Esedra Kruger (esedra.kruger@up.ac.za)
Students: Tatiana de Aguiar
Claudia Lilje
Shanae Stevens
Gabriela Lange at, u18129677@tuks.co.za

APPENDIX H: Ethical Clearance

UNIVERSITEIT VAN PRETORIA
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YUNIBESITHI YA PRETORIA

Faculty of Humanities
Fakulteit Geesteswetenskappe
Lefapha la Bomotho

Humanities 100. Since 1919

29 February 2024
Dear Researchers,

Project:	Specialised medical professionals' perspectives on oral feeding practices of infants and young children receiving high flow oxygen
Researchers:	Claudia Lilje (u19033827) Shanae Stevens (u21657999) Gabriela Lange (u18129677) Tatiana de Aguiar (u20424851)
Supervisors:	Dr E Kruger, Mrs. B Pillay
Department:	Department of Speech-Language Pathology and Audiology
Reference Number:	SLPA2024/04

Thank you for the application submitted to the Research Committee of the Department of Speech-Pathology and Audiology, Faculty of Humanities. We have the pleasure of informing you that the above application was approved on 29 February 2024.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal.

We wish you success with the project.

Sincerely

Pottas
Chair: Departmental Research Committee

Prof J van der Linde
HEAD: DEPARTMENT OF SPEECH-LANGUAGE PATHOLOGY AND AUDIOLOGY
UNIVERSITY OF PRETORIA

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