Physiotherapy management at a paediatric burns unit during the COVID-19 lockdown period in South Africa

S Hendricks BSc (Physiotherapy), **S Mhlongo**, BSc (Physiotherapy), **M Maahir** BSc (Physiotherapy),**N Ntinga**, MSc (Physiotherapy)

Physiotherapy Division, Department of Health and Rehabilitation, University of Cape Town, South Africa

Corresponding author: *N Ntinga (nomusa.ntinga@uct.ac.za)*

Background. The impact of the COVID-19 pandemic on the management of patients in burn units has been under-explored. Paediatric burns are traumatic and often require emergency care owing to the vulnerability of children. Physiotherapy is crucial for managing burn patients, helping them return to optimum functional levels.
Objectives. To explore the perceived experiences of physiotherapists working in a paediatric burns unit during the COVID-19 lockdown, in South Africa (SA).
Method. A qualitative study was conducted using focus group discussions with three physiotherapists employed in a paediatric burns unit, in SA. The discussions were audio recorded, transcribed and captured onto an Excel sheet for inductive thematic data analysis.
Results. The concerns raised by the physiotherapists included compromised referral systems, patient communication issues and reduced mental wellbeing among the physiotherapists themselves. The participants experienced challenges with constantly changing management protocols, lack of personal protective equipment (PPE) and a sharp increase in non-clinical workload.
Conclusion. The perceived physiotherapists' challenges brought on by the COVID-19 pandemic did not impact their effectiveness in managing paediatric burns patients but spoke to their resilience, which is an important trait of healthcare professionals.
Keywords. Physiotherapy, paediatric burns, COVID-19 lockdown, qualitative descriptive, focus group discussions.

Undergraduate Res Health 2024;2(2):1761. https://doi.org/10.7196/URHJ.2024.v2i2.1761

Sarah Barnes (nee Hendricks) now works in Clinical Governance and through her work she hopes to drive the implementation of Value-based healthcare (VBC) across South Africa through the promotion of accountability within the clinical space, monitoring of patient outcomes and maintaining a dialogue about VBC amongst healthcare providers. As part of their undergraduate research course, the authors showed interest in research focusing on physiotherapy management of paediatric burns at the paediatric burns unit in Red Cross War Memorial Hospital during the COVID-19 lockdown period in South Africa.

Injuries caused by burns may inhibit crucial childhood social, psychological and physical motor development.[1] Paediatric burn injuries may cause multisystem failures, resulting in a devastating impact on the physical development of a child.[2] Physiotherapists are healthcare professionals who assess and treat patients with burn injuries by optimising the physical, non-pharmaceutical management of pain, motor skills and cardiovascular fitness levels.[3] This study aimed to investigate the perceived impact of the COVID-19 lockdown based on physiotherapists' management of paediatric burns in a burn unit at a children's hospital in South Africa (SA), from March - June 2020 (Level 4 - 5 COVID-19 lockdown). Limited studies have discussed the impact of the COVID-19 hard lockdown on the physiotherapy management of paediatric burn patients in the SA context, which can be considered a prototype for the African burn unit.[4] The importance of this study was to highlight the experiences of physiotherapists during a healthcare crisis, aiming to determine how future crises can be successfully navigated.

Prevalence and incidence of burns

In 2019, the World Health Organization (WHO) reported that burn injuries are one of the main causes of Disability Adjusted Life Years (DALY) lost, with the highest prevalence among male children.[1] This aligns with findings from a retrospective study conducted by Angelou *et al*.,[5] which focused on adult burns. Another retrospective observational study by Karim *et al*.[6] also demonstrated that male patients accounted for the majority of burn injury cases. According to Govender *et al*.,[7] burns contribute to disabling SA children. The preventable nature of disability resulting from burns highlights the significance of our study, which aims to optimise the physiotherapy management of these patients. The goal is to decrease their DALY and prevent secondary complications.[8]

Physiotherapy assessment and management of paediatric burns

The assessment of burns involves both subjective and objective components. The subjective aspect includes evaluating the patient's history, such as the cause of the burn, social history and any previous developmental conditions that might impact prognosis. The objective

assessment requires determining the total body surface area using methods like the Rules of Nines and the Lund and Brewer chart to establish the extent and severity of the burn.[9] Additionally, the Pain Observation Scale for Young Children and an assessment of the depth and extent of the burn, with a focus on high-impact areas of the body, are important for measuring the severity of the burn. The assessment of burns includes evaluating the presence or absence of inhalation injuries, conducting a thorough oedema assessment, and using outcome measures such as the Burn Specific Health Scale -Brief (BSHS-B) to examine the physical and psychosocial functioning of burn patients. Quality of life is assessed using the Burns Scar Index (Vancouver Scar Scale). Finally, with a thorough physical assessment.[10] The physiotherapy assessment involves observing gross motor developmental milestones, focusing on measuring, maintaining and improving functional joint range of motion and muscle strength.[11] The rise in popularity of family-centred healthcare approaches suggests that the child should be treated holistically within the multidisciplinary team to achieve full recovery after such a traumatic event.[12]

Regular wound debridement and physiotherapy are commonly used techniques in the medical management of adult and paediatric burns.[5,13] In a retrospective study by Angelou *et al.*,[5] all adult participants received physiotherapy during their hospital stay. Range of motion (ROM) in affected areas, muscle strength and independent function were important outcomes recorded upon discharge. However, the study conducted by Angelou *et al.*[5] did not consider the impact of the COVID-19 pandemic, which Moynihan *et al.*[14] suggest should be acknowledged, as COVID-19 had a direct impact on intensive care unit admissions and patient management protocols. According to McIntosh *et al.*,[15] COVID-19 inversely impacted other hospital admissions: as COVID-19 lockdown levels decreased, patient admissions increased.

Paediatric patients can experience a range of secondary complications from burns, including functional and aesthetic issues because of extensive scarring, contractures, loss of bone mass and developmental delay.[16] The use of virtual reality (VR) to distract children during burn management has gained in popularity, with the additional benefit of reducing perceived pain.[17] For instance, Lozano and Potterton[18] found that using VR (e.g., Xbox) as an adjunct to physiotherapy resulted in better active ROM between discharge and follow-up, as well as higher compliance and enjoyment of therapy, owing to its competitive distraction capabilities. This is supported by Schimmitt *et al.*,[19] who found that early aggressive physiotherapy helps to improve ROM, reduce the formation of contractures, improve mobility, increase muscle strength and decrease long-term disability, with VR informing lower pain scores.[19]

In the retrospective study conducted by Takino *et al.*,[20] 92% of paediatric burn patient records analysed were referred to physiotherapy. Treatment techniques included airway clearance manoeuvres, chest re-expansion, cough stimulation, positioning, active ROM exercises, passive ROM exercises and stretches—all while incorporating age-specific play and interaction.[18,20]

A clinical trial conducted by Tang *et al*,[21] in a high socioeconomic setting compared the outcomes of burn patients with and without rehabilitation interventions, using measures such as the Modified Barthel Index, Pittsburgh Sleep Quality Index and World Health Organization Quality of Life – BREF. The study showed that early rehabilitation resulted in better functional outcomes, quality of life and independence, highlighting the importance of early rehabilitative interventions within the treatment of paediatric burns.

Impact of COVID-19 on health services in SA

A large proportion (71%) of physiotherapists in the public and private sector in Africa reported disruptions in physiotherapy services during the COVID-19 pandemic.[22] These disruptions were mostly reported during the hard lockdown when only essential physiotherapy treatment was allowed. Many patients did not attend sessions owing to the initial lack of personal protective equipment (PPE), vaccination protection and fear of exposing themselves and their loved ones.[23] Physiotherapists were relocated from other rehabilitation duties to support emergency plans and treat COVID-19 inpatients. PPE shortages were a significant concern, with 86% of African participants reporting a lack of PPE.[22] COVID-19 protocols adapted by hospitals varied; some restricted the use of physiotherapy gyms, limiting physiotherapists to in-ward treatment which may be less effective and less stimulating.[22]

Public v. private healthcare sector in the management of paediatric burns

There are stark differences in the treatment of burns between private and public healthcare facilities in SA because of the disparities in resource allocation and healthcare personnel. Private facilities, such as Netcare and Life Hospitals, have adequate staffing, world-class facilities, dedicated burns units and highly specialised equipment to ensure the best possible outcome for patients. In contrast, public healthcare settings often have only basic rehabilitation personnel, equipment and services, with specialised services typically restricted to tertiary facilities like the paediatric burns unit.[24] Despite studies on paediatric burns management in the public health sector by Lozano and Potterton[18] as well as Morris *et al.*[25] research comparing the management of paediatric burns between the public and private healthcare sectors is yet to be conducted.

A study by Hassem *et al.*,[26] reported that the well-being of SA physiotherapists deteriorated because of the COVID-19 pandemic. Physiotherapists reported increased stress, burnout and emotional exhaustion owing to their heightened exposure to bodily fluids, atypical workload demands and the challenges with wearing PPE and adhering to new hygiene protocols.[26]

We sought to answer the question: 'How were the lived experiences of physiotherapists in the management of paediatric burns impacted during the COVID-19 hard lockdown?'

This study aimed to determine the perceived impact of the COVID-19 lockdown on the physiotherapy management of paediatric burns patients between March and June 2020 (Level 4 - 5 lockdown). A qualitative inquiry was best suited to describe and understand participants' experiences of this social phenomenon.[27]

The objectives were to:

- describe the perceived number of paediatric burn admissions during COVID-19 in 2020 in Red Cross Children's Hospital (RCCH) during levels 4 - 5 lockdown (March - June 2020)
- describe the mechanisms of burn injuries in admitted paediatric patients during the stipulated period
- explore the perceived ratio between male and female paediatric burn admissions

- explore the differences in the severity of burns in prior years
- explore the perceived lived experiences of physiotherapists during the COVID-19 hard lockdowns, with a specific focus on their management of paediatric burn patients
- explore the perceived changes in the physiotherapy management of paediatric burns patients at RCCH owing to the COVID-19 lockdown

Methods

This study employed a qualitative design, using focus group discussion (FGD) to explore the physiotherapists' perceptions of how the COVID-19 lockdown impacted the management of paediatric burns patients in a paediatric burns unit in SA.

Inclusion criteria

The inclusion criteria were physiotherapists who worked in the paediatrics burns unit between March and June 2020 and had at least five years of relevant clinical experience. We excluded any physiotherapists who did not consent to participate in the study or who worked less than the required timeframe, as their involvement would not provide sufficient insight into the changes brought about by COVID-19.

Recruitment and enrolment

Ethics approval of the study was granted by the University of Cape Town Human Research Ethics Committee (ref. no. HREC 095\2022) and the paediatric burns unit research committee. The head of the physiotherapy department was contacted via email to share the study information, inclusion criteria and consent forms with potential participants. Once approval was received, an additional email was sent to the potential participants to arrange a convenient time for a virtual FGD.

Recruitment and sampling

A convenience sample was obtained, with three participants consenting to be part of the study. A virtual meeting date and time were arranged for both participants and researchers. The following instruments were used: self-designed stimulus questions, Likert scales for piloting the stimulus questions, a laptop, earphones, a cell phone, Microsoft (MS) Teams, Word and Excel.

Pilot study

A pilot study was conducted with two physiotherapists who met the inclusion criteria of having five or more years of experience and having worked with burn patients. The pilot study allowed researchers to assess the effectiveness of the interview questions and process and to identify any response biases.

For the pilot study, two physiotherapy participants were identified, emailed the information sheet and provided with a consent form. During the virtual MS Teams meeting, the participants were asked stimulus questions and requested to use a Likert scale to rate each question on its clarity and ease of understanding. They were also invited to suggest improvements for better clarification. Upon completion of the pilot study, the comments, suggestions and Likert scale scores were collected and used to revise and improve the final stimulus questions for the main study.

Methods for pilot study

The FGD was conducted online via MS Teams, which was convenient for both researchers and participants. The FGD lasted 90 minutes and was recorded and transcribed using MS Teams with all three participants and researchers present to pose the stimulus questions (Appendix B). The written transcription was verified for accuracy by comparing the audio recording with the Word document.

Data management

The raw data from the FGD were recorded and transcribed using MS Teams. The transcription was reviewed and corrected by the research team. Member checking was then conducted at the paediatric burns unit to ensure the accuracy of the transcription. The data were saved in a password-protected folder with participant names replaced by codes to ensure anonymity. This folder will be kept for 2 years without delegation to third parties, after which all data, including back-ups, will be permanently deleted.

Data analysis

The original transcription from MS Teams was reviewed by the researchers against the audio recording to correct errors made by the automated transcription. A directed content analysis and an inductive approach were used to present the information. The inductive approach was chosen because it focuses on generating new theories from qualitative data, such as themes and codes derived from the stimulus questions.[28] To ensure the trustworthiness of the information obtained, the study adhered to strategies including credibility (e.g., member checking), transferability, dependability and confirmability.[29] An independent researcher with qualitative research experience analysed random samples of the data to ensure accuracy. The researchers read and re-read the transcribed information, then transferred it to an Excel sheet where participants' responses were categorised into codes and ultimately into themes, supported by the corresponding quotes.

Ethical considerations

This study complies with the latest Declaration of Helsinki[30] including the principles of autonomy, beneficence, non-maleficence, justice and confidentiality, and did not award any compensation or reimbursement to participants. Approval to conduct the research was granted by the Western Cape Health Department, University of Cape Town (UCT) HREC (No. 095\2022) and the research committee of the paediatric burns unit. Participant anonymity was safeguarded using codes in place of their names. The trustworthiness of the research was maintained through a pilot study, member checking and proper data storage procedures, including password-protected storage of the raw data. Reliability was ensured by having an independent researcher perform an inductive thematic analysis of the FGD transcription to verify that the data analysis was consistent and reproducible.

Results

Participants (P1, P2 and P3) responded to each of the stimulus questions during the FGD, and the summary of all the major themes with supporting quotes is presented in Table 1.

In response to Stimulus Question 1, participants discussed the varied physiotherapy techniques used for the treatment of paediatric burns. One prominent theme was the reduction in treatment, which was attributed to several factors: the COVID-19 pandemic affected the type and

Table 1. Summary of major themes and quotes

Q1. Major themes in the management of paediatric burns	Quotes
Limited treatment time/exposure	'And also, if the patient did have COVID, you would treat them less than what we normally see them' '…it was all about just limiting exposure because we did have to treat other children in the hospital' 'Kiddy was alone in the room, so they didn't get therapy on the days that you didn't go in and you had to limit your exposure'
	Neurodevelopmental therapy techniques: 'So, we'll use neurodevelopmental therapy techniques in trying to encourage, especially in the babies, to encourage function'
	Scar management: 'There are quite a variety of scar management techniques to teach parents…we had to teach how to do scar management as well, from day one'
	Chest Modalities: '…. the child needs will be looking at the respiratory system, so chest physio, mobilizing and bubble blowing…'.
	Parent education: 'Teaching parents…this time from day one…teaching first aid, burn prevention and Sunblock to allow for early discharge,'
Q2. Major themes in subjective assessment	**Quotes**
Importance of in-depth subjective assessment	'It also helps in cases where it's an NAI (non-accidental injuries) to distinguish whether the stories are the same to what actually happened to the patient because some parents will give you one story, but when you look at the burn, it doesn't make sense for the child be burnt that way. So that's why it's very important to know exactly what happened to that patient'
	Multidisciplinary team collaboration: 'So, we work with the doctors, the nurses, the social workers, all involved in the cases try and get as much information out of the patient and the caregivers as possible'
	Causes of injury specifics: 'Specifically, for burns we try to look at the cause of burn, the mechanism of burn, the type of burn.'
	Subjective assessment guides treatment: 'We use that information to help guide us in education of the patient's or burn prevention, first aid of the other person.'
	NAI assessment: 'It also helps in cases where it's an NAI to distinguish whether the stories are the same to what actually happened to the patient'
	Initial first aid management at home: 'If they get burnt, so it's educating them about not using toothpaste and egg and all those things'.
Q3. Major themes to principles of patient care	**Quotes**
Increased pain due to burns	Taking precautions: 'We need to look at the fear element, anxiety, as well as the pain when assessing the patient.' 'Making sure that analgesia is on board with analgesia and something that also works.'
	Cluster care: 'So, we try and do our painful procedures together with other painful procedures, like the dressing changes, with joint stretches and we also go with patients to theatre and maybe we can do a full range of movement assessment on them whilst sedated'
	Burn-related outcome measures: 'More use of your pain scales then that's specific to the ages of the child. You can also use various outcome measures to look at the scar or they're itching something like the itch man or the Vancouver scar that is different for paediatric burns'.
	Distraction techniques: 'So, the use of just non-pharmacological techniques such as virtual reality distraction techniques, how you engage the child into playing versus using an adult'.
Special/specific objective testing for the distinct types of burns	'We do specifically look at different areas and the different types, do we have circumferential burns and the kind of things we need to assess there. The perineal burn, the respiratory burns - so all those things will need to be there'.
	Special tests: 'The special test we would do, I think would probably be similar to looking at the depth of the burn, assessing circulation and looking for signs of respiratory and inhalation injuries. The electrical burns - we look at the other functions and how that impacts their vital signs, cardiac function'.
Deliberate, rapid return to function and movement	'The general principles I suppose are all the same in looking at function and movement for patients and looking at how we can get them as quickly as possible returned to their pre-injury function and development'.
Multidisciplinary approach to management of paediatric burns patient	'And the key elements I think to treating burns patient not just paediatrics is a multidisciplinary approach. So, it's not just physio it's OT dietitian nursing staff, your surgeons. Everybody is a key role player in managing the patients and the patients and their parents for everything'.

…continued

Table 1. (continued) Summary of major themes and quotes

Q4. Major themes to outcome measures used in patient management	**Quotes**
Pain scale outcome measures	'You definitely have the different types of pain scales you've got, like the FLACC you've got the NIPS, the long Baker. VAS scale from a pain perspective, your itch, man, your Vancouver scar scale'.
Special objective tests	'Range of movement, so your goniometry, your muscle strength tests and your range of movement. Also, your obers test, your Thomas test'.
Functional outcome measures	'Timed up and go, 6-minute walk test but in the same breath you can modify based on the patient'.
Q5. Major themes change brought on by COVID lockdown on patient management	**Quotes**
Loss of engagement with the patient	'So, we call it nonverbal communication that's very important in a paediatric environment. We, as much as we're inflicting pain, got silly, funny and happy faces most of the time and all of that is lost with masks'. 'Language barriers was also impacted with having a mask like you are mumbling half the time. A lot of our parents don't understand English so that was a challenge, even if you try to speak isiXhosa and Afrikaans, a lot of that was lost due to having to wear masks'. Contact precautions: 'I think the extra contact precautions also we often would, especially with the baby's pick them up and console them during an assessment or treatment and that is limited now because of the extra precautions'.
Shortages in PPE	'Perhaps initially it was a combination of lack of PPE, so we didn't always have the appropriate PPE available.'
Limited treatment time/exposure	'And also, if the patient did have COVID, you would treat them less than what we normally see them'. '…it was all about just limiting exposure because we did have to treat other children in the hospital'. 'Kiddy was alone in the room, so they didn't get therapy on the days that you didn't go in and you had to limit your exposure'.
Prioritising patients	'To an extent wasn't we could just do physio, we were called to do other things in the hospital'. 'So, we had to be very picky, but selective about who we're able to see'. 'Yeah, so you didn't have that long rehab sessions or time in hospital that you normally have'.
Increased anxiety	'And the anxiety, everybody was nervous and scared COVID, so the rules at the time were very strict about who can access a patient...'. 'And then also our internal anxiety about, being exposed now to a COVID patient'. 'Everybody fearing for the worst …'.
Q6. Major themes to causes of burns and admission rates	**Quotes**
Mostly hot water burns	'So generally, the most common mechanism of injury that we see is the hot water burn'.
Second cause was flame burns	'First hot water and it followed by flame'. 'Hot water burns and flame burns are the two most popular'.
No shift noticed for in- patient's admissions	'What we did notice that there was actually it was like normal admission numbers and a normal admission trend'.
Other types of burns seen	'Those are the two most popular, but we do see electrical burns and we see chemical burns as well. Also, hot stoves, a hand or a body part on a hot stove'.
Q7 - 9. Major themes to patients' admission rates and access to physical therapy	**Quotes**
High admission, low-socioeconomic families	'Mostly lower socio-economic but that has not changed pre-COVID and during COVID'.
Exacerbation in lower-socioeconomic presentation	'Lower socioeconomic families do come in, and they do appear to be in more dire threats than what they were before with the lack of employment, lack of income'.
No significant difference	'I don't think there was any difference between pre COVID and now'.

…continued

Table 1. (continued) Summary of major themes and quotes

Q10. Major themes barriers to burns management	Quotes
Lack of transportation and access to health facilities	'…access to the hospital, the limitations on public transport, on curfews. All those things did impact on how patients could access the hospital and access services in general. That the smaller clinics were closed'.
Tasked with doing non-physio duties	'We had to be split into doing non physio duties as well to help with COVID screening and other duties'.
prioritisation of patients at the expense of others	'Burns was limited as well so we could only essentially get to the more urgent cases and not much access to the COVID patients themselves'.
Q11. Major themes to solutions to barriers to management	**Quotes**
Empowering clinics and healthcare workers	'We tried to empower clinics in managing burns more proactively. So, they've done outreach, webinars and teaching, to other centres where we taught the nurses, the doctors, the therapist at other levels of care to manage a burns condition'.
Empowering patient selfcare	'We did with the OTs provide them with scar management booklets and some scar management creams'.
Providing bandages and management kits to caregivers	'Red Cross gives them all the dressing changes that they will need for the clinic because lots of dressing, the bandages and the actual dressings that they need. So, the clinic isn't necessarily because a lot of them haven't got it in stock'.
Improving accessibility to care	'So, what I think has been done is trying to get these patients referred to their local services for management. Instead of bringing patients back here once a week of dressings changes, they are coming once a month maybe and in between they're getting the dressing changes locally. So that has I think improved their access to care, costs considerably less for them to go to a local clinic instead of driving all the way to Red Cross'.

NAI = non-accidental injuries; OT = occupational therapy; FLACC = Face, Legs, Activity, Cry and Consolability tool; NIPS = Neonatal-Infant Pain Scale; VAS = visual analogue scale; PPE = personal protective equipment.

duration of physiotherapy treatments by increasing the workload and time management demands on physiotherapists. Additionally, the need to constantly adapt protocols to manage the rapidly evolving demands of the pandemic, including various waves of COVID-19, was highlighted by the participants. P3 stated: 'Teaching parents…this time from day one…teaching first aid, burn prevention and Sunblock to allow for early discharge…'.

In response to Stimulus Question 2, participants highlighted the importance of a thorough subjective assessment. This assessment included collaboration with the multidisciplinary team and family and the use of clinical experience to rule out any foul play in the cause of the burn injury. Other identified themes were the early introduction of first aid and the educational advocacy role that physiotherapists play during the subjective assessment. P1 noted: 'It also helps in cases where it's an NAI (non-accidental injuries) to distinguish whether the stories are the same to what happened to the patient because some parents will give you one story, but when you look at the burn, it doesn't make sense for the child be burnt that way. So that's why it's very important to know exactly what happened to that patient'.

P2 added: 'It also helps in cases where it's an NAI to distinguish whether the stories are the same to what actually happened to the patient'. P2 also mentioned that a subjective examination aids in prevention: 'We use that information to help guide us in education of the patient's or burn prevention, first aid of the other person…'.

Participants responded to Stimulus Question 3 by expressing that the increased pain caused by burns required precautions, distraction techniques and multidisciplinary team involvement during hands-on assessments of joint and muscle function. P2 explained the importance of cluster care: 'So, we try and do our painful procedures together with other painful procedures, like the dressing changes, with joint stretches and we also go with patients to theatre and maybe we can do a full range of movement assessment on them whilst sedated'. Another participant (P1) stressed the importance of distraction to achieve function: 'So, the use of just non-pharmacological techniques such as virtual reality distraction techniques, how you engage the child into playing versus using an adult…'.

Participants responded to Stimulus Question 5 by emphasising the importance of various outcome measures used by physiotherapists to assess and track paediatric burns patients. These measures included the Itch Man Scale, the visual analogue scale (VAS), the Face, Legs, Activity, Cry and Consolability (FLACC) tool and the Neonatal-Infant Pain Scale (NIPS). P3 also mentioned several specific tests such as 'Range of movement, so your goniometry, your muscle strength tests and your range of movement. Also, your Ober's test, your Thomas test…'.

Participants responded to Stimulus Question 5 by emphasising the impacts of the compulsory wearing of masks on their practice. They noted a loss of non-verbal communication with patients, which is crucial in a paediatric setting. 'So, we call it nonverbal communication that's very important in a paediatric environment. We, as much as we're inflicting pain, got silly, funny and happy faces most of the time and all of that is lost with masks…'.(P2)

P1 expressed: '… Language barriers was also impacted with having a mask like you are mumbling half the time. A lot of our parents don't understand English so that was a challenge, even if you try to speak isiXhosa and Afrikaans, a lot of that was lost due to having to wear masks'.

The theme of increased anxiety was also noted, particularly because of having to prioritise certain patients while neglecting others because of

the increased administrative and non-clinical workload. P3 conveyed: 'I think the extra contact precautions also we often would, especially with the baby's pick them up and console…'. Another participant expressed that the time during an assessment or treatment was limited now because of the extra precautions and need for PPE brought on by the rapidly progressing pandemic: 'And also, if the patient did have COVID, you would treat them less than what we normally see them…' and '… it was all about just limiting exposure because we did have to treat other children in the hospital…'. (P2)

Participants responded to Stimulus Question 6 by expressing that the mechanisms of injury (MOI) for burn patients before the COVID-19 lockdown were primarily hot water scalds and flame injuries. This trend remained unchanged during the COVID-19 lockdown.

In response to Stimulus Question 7, which asked about trends in the admission of paediatric burn patients in 2020 compared with pre-COVID years, participants observed increased admission rates among families from lower socioeconomic backgrounds, exacerbated by poverty. Participant P1 noted: 'Lower socioeconomic families do come in, and they did appear to be in more dire threats than what they were before with the lack of employment, lack of income…'. Some participants expressed no observable differences.

Participants responded to Stimulus Question 8, 'What challenges were worsened by the lockdown in paediatric burns?' by expressing several key issues. They noted an increased workload for all healthcare workers beyond their usual scope of practice and a lack of transportation available to families, leading to some patients not receiving timely treatment. This was compounded by the need for brutal prioritisation during the pandemic and a resultant reduction in access to healthcare resources. P3 conveyed: 'Burns… was limited as well so we could only essentially get to the more urgent cases and not much access to the COVID patients themselves'.

Participants responded to Stimulus Question 9, 'What can be done to address these challenges going forward?' by emphasising the need to empower local healthcare facilities to become key decision-makers. P3 stated: 'We tried to empower clinics in managing burns more proactively. So, they've done outreach, webinars, and teaching, to other centres where we taught the nurses, the doctors, the therapist at other levels of care to manage a burns condition'. Additionally, participants highlighted the importance of improving patient self-care through education. P3 expressed: 'We did with the OTs provide them with scar management booklets and some scar management creams...'.

Participants responded to Stimulus Question 10 by expressing the elitist nature of VR because of its high costs, which limited its use to the acute phases of patient management. Despite this, VR was valued for its role as an incentive and pain distraction. P1 explained: 'So, we have used it to some degree in the unit, we don't use it purely for the whole therapy. We use it as an adjunct to the other therapies that we do. Also, as an incentive or reward for them.' Continued access to VR was provided at follow-up appointments to maintain its benefits.

Participants responded to Stimulus Question 11 'Did COVID-19 impact your mental/emotional wellbeing? If so, did this impact your effectiveness as a physiotherapist?' by expressing that the numerous challenges faced by the participants were compounded by the COVID-19 pandemic, resulting in a negative impact on their mental well-being. The reasons included increased vulnerability for themselves and loved ones, the unknown impending doom, isolation from having to continue working without adequate knowledge and the possibility of being potential spreaders of the virus to patients and family members. P2 expressed: 'For me personally, my whole family would ask about COVID so it is constantly us having to be those people to answer the questions and help fight fake news, media, and help to calm other people around us while we also try to stay calm…'. Another theme emerged when participants noted the relief that was brought on by early access to vaccines to ensure that patients were seen. P1 said: 'As soon as we started, there was their whispers of vaccines. As soon as we got ourselves vaccinated, it was like the sense of relief, like you had a little bit of extra armour…'.

Discussion

The results of this study show that the COVID-19 pandemic had a multifaceted impact on the physiotherapy treatment of paediatric burns during the hard lockdown. The pandemic affected the type and duration of physiotherapy treatments, increased work and time management demands on physiotherapists required constant adaptation of protocols to address the changing demands brought on by the various waves of COVID-19. Furthermore, the COVID-19 pandemic negatively impacted the mental well-being of the participating physiotherapists. Despite these challenges, they remained committed to providing effective treatment to patients.

Open flame and scalding injuries are common causes of paediatric burns in SA households, often resulting from inadequate access to electricity, substandard housing and easy access to hot liquids and preparation of foods caused by daily exposure to high-risk activities and energy sources preferences.[31] The results from this study show that the MOI for burn patients, such as hot water scalds and flame injuries, remained unchanged during the lockdown periods. According to van Niekerk,[32] a switch in the MOI trend is unlikely, considering the limitations on movement outside the home and restrictions in access to many facilities during the lockdown periods. Non-accidental injuries (NAIs) as causes of paediatric burns were not included in the scope of the study. However, their importance was highlighted during the FGD, where the reasoning for an in-depth subjective interview was to identify potential NAIs. This feedback aligns with a review by Paul and Adamo,[33] which concludes that 35% of paediatric burns are due to abuse.

The findings of this study indicate that the outcome measures used on paediatric burn patients by the physiotherapists in the paediatric burns unit include the Itch Man Score, VAS, FLACC and NIPS. According to Erickson and Kim,[34] the use of these subjective outcome measures, specifically VAS and Itch Man, is user-friendly, valid, reliable and effective.

As part of paediatric burns scar management, Liuzzi *et al.*[35] found that the most common modalities used universally are moisturising and scar massage, pressure therapy, splinting and maintaining the ROM of affected joints. This aligns with the responses of the participants in the FGD. The use of VR in paediatric clinical settings has been found to reduce pain and serve as a useful distraction during unpleasant but high-impact treatments, suggesting that public healthcare sector funds should invest in it.[36] The findings from this study also align with the notion that VR should be used as an adjunct to therapy, serving as an incentive or distraction from painful treatment. In the low-socioeconomic environment of the SA public healthcare setting, this is necessary for acute treatment, as it is difficult to maintain considering the limitations to Wi-Fi, electricity and electronic devices for most patients. This study concludes that the use of VR in a clinical setting is a useful distraction

during unpleasant treatments, supporting these findings as demonstrated in a mixed-methods pilot feasibility study conducted by Addab *et al*.[37]

The mental wellbeing of health professionals during times of crisis has been shown to directly impact patient outcomes, especially in highly specialised healthcare settings.[38] The findings from the FGD support the findings of Hassem *et al*.,[26] indicating that the mental well-being of physiotherapists has been negatively impacted by the COVID-19 pandemic. As mentioned by Haines and Berney,[39] the various challenges faced by healthcare workers were compounded by the COVID-19 pandemic, resulting in a negative impact on their mental well-being. Building trauma-informed care is essential, as it fosters grit and resilience in healthcare workers.[40]

The socioeconomic effects of the lockdown on informal and formal trade cannot be underplayed. Livelihoods were lost and unemployment was at an all-time high.[41] The FGD participants observed that families from low socioeconomic backgrounds appeared to be in an exacerbated state of poverty during the hard lockdown. This observation aligns with the findings of Channing,[42] which state that lockdown restrictions negatively impacted the overall household income and food security of low socioeconomic families more significantly than others. However, the impacts of the drop in household incomes on the healthcare outcomes of patients were not explored.[43]

Limitations

First, this study was conducted at a single-site paediatric burns unit, which limited reproducibility and generalisation. As a result of being a single-site study, data saturation did not occur. Second, the nature of this study design required participants to recollect information from two years prior. This may have resulted in recall bias and decreased the reliability of the information received from the participants. Third, participants were recruited via convenience sampling and were thus not representative of the general population. Lastly, this study was based on the perceived experiences of physiotherapists in the management of paediatric burns, which means the participants' bias and subjectivity have greatly influenced the findings of this study.

Implications for future research

There is an important place for qualitative research in physiotherapy practice to provide transformative research where pivotal questions that arise in the clinical setting may be explored. The nuances that can be picked up in qualitative research can answer some difficult questions and bring transformative changes that inform the social reality of being a physiotherapist. Qualitative studies include first-person disclosures of experiences regarding social reality, politics, awareness and discoveries from participants' perspectives. This study provides insights into the physiotherapy perspective on the challenges faced while treating paediatric burns during the COVID-19 hard lockdown. However, studies focusing on the perspective of other health professional members of the multidisciplinary team would be valuable. This would provide insight into the challenges faced by the multidisciplinary team as a whole and how we can support each profession in future times of crisis.

Conclusion

The impact of lockdown policies, such as the restrictions on movement and access to various facilities, influenced the social and economic aspects of both patients and health professionals. The effect in the healthcare sector was expected to worsen, especially regarding burns and their MOI, with increased exposure to household hazards because of the population being mandated to stay at home.

No apparent increase in admissions rates was observed; however, the effects on the treatment of burns patients manifested through reduced treatment duration, increased contact precautions, communication challenges due to mask-wearing and shortages of PPE. The uncertainty and anxiety caused by the COVID-19 lockdown negatively impacted the mental wellbeing of the FGD participants. The participants experienced challenges with constantly changing management protocols and workloads in addition to concerns regarding the health of their patients, their families and themselves. Regardless of these challenges, the participants feel that their effectiveness in the management of paediatric burn patients was not affected.

Declaration. I declare that this original work is composed partly of my and co-authors' previous application for an undergraduate physiotherapy degree.

Acknowledgements. The physiotherapy staff at Red Cross Children's Hospital for their time, service and valuable contribution to this publication.

AI declaration. The authors acknowledge the journal policy on the use of AI, and the requirement to disclose the use of any AI tools in manuscript preparation.

Author contributions. NN, as the supervisor, assisted in the conceptualisation of the study and guided each step of the thesis to completion. The UCT undergraduate physiotherapy students of the class of 2022, SH, SM and MM collected, analysed and reported on the data findings.

Funding. None.

Conflicts of interest. None.

1. World Health Organization Burns. 2019. https://www.who.int/news-room/fact-sheets/detail/burns (accessed 6 May 2022).
2. Barrios EL, Polcz VE, Moldawer LL, Rincon JC, Efron PA, Larson SD. Variables influencing the differential host response to burns in pediatric and adult patients. Shock 2023;59(2):145-154.
3. Patel KF, Rodríguez-Mercedes SL, Grant GG, et al. Physical, psychological, and social outcomes in pediatric burn survivors ages 5 to 18 years: A systematic review. J Burn Care Research 2022;43(2):343-352. https://doi.org/10.1093/jbcr/irab225
4. Albertyn R, Numanoglu A, Rode H. Pediatric burn care in sub-Saharan Africa. Afr J Trauma 2014;3(2):61-67.
5. Angelou IK, van Aswegen H, Wilson M, Grobler R. A profile of adult patients with major burns admitted to a Level 1 Trauma Centre and their functional outcomes at discharge: A retrospective review. S Afr J Physiother 2022;78(1):1543.
6. Karim A, Laurent A, Deghayli L, et al. Retrospective evaluation of progenitor biological bandage use: A complementary and safe therapeutic management option for prevention of hypertrophic scarring in pediatric burn care. Pharmaceut 2021;14(3):201. https://doi.org/10. 3390/ph14030201
7. Govender R, Kimemia D, Hornsby N, van Niekerk A. Differentiation of paediatric burn injury by household energy source in South Africa. J Energy South Afr 2020;31(2):48-58. https://journals.assaf.org.za/index.php/jesa/article/view/8096
8. Atiyeh B, Dibo SA, Janom HH. Telemedicine and burns: An overview. Ann Burns Fire Disasters 2014;27(2):87-93.
9. Murari A, Singh KN. Lund and Browder chart-modified versus original: A comparative study. Acute Crit Care 2019;34(4):276-281. https://doi.org/10.4266/acc.2019.00647
10. Zieliński M, Wróblewski P, Kozielski J. Prognostic factors in patients with burns. Anaesthesiol Intensive Ther 2020;52(4):330-335. https://doi.org/10.5114/ait.2020.97497
11. Lang TC, Zhao R, Kim A, et al. A critical update of the assessment and acute management of patients with severe burns. Adv Wound Care 2019;8(12):607-633.
12. Seniwati T, Rustina Y, Nurhaeni N, Wanda D. Patient and family-centered care for children: A concept analysis. Belitung Nurs J 2023;9(1):17-24.
13. Griffin B, Bairagi A, Jones L, Dettrick Z, Holbert M, Kimble R. Early non-excisional debridement of paediatric burns under general anaesthesia reduces time to re-epithelialisation and risk of skin graft. Scient Rep 2021;11(1). https://doi.org/10. 1038/s41598-021-03141-x
14. Moynihan R, Sanders S, Michaleff Z, et al. Impact of COVID-19 pandemic on utilisation of healthcare services: A systematic review. BMJ Open 2021;11(3):e045343. https://doi.org/10. 1136/bmjopen-2020-045343
15. McIntosh A, Bachmann M, Siedner M, Gareta D, Seeley J, Herbst K. Effect of COVID-19 lockdown on hospital admissions and mortality in rural KwaZulu-Natal, South Africa: Interrupted time series analysis. BMJ Open 2021;11(3):e047961.
16. Atiyeh B, Janom H. Physical rehabilitation of pediatric burns. Ann Burns Fire Disasters 2014;27(1):37-43.
17. Malloy KM, Milling LS. The effectiveness of virtual reality distraction for pain reduction: A systematic review. Clin Psych Rev 2010:30(8):1011-1018. https://doi.org/10.1016/j.cpr.2010.07.001
18. Lozano EI, Potterton JL. The use of xbox kinect in a paediatric burns unit. South African J Physiother 2018;74(1):1-7. https://hdl.handle.net/10520/EJC-ee9e605ea
19. Schmitt Y, Hoffman H, Blough D, et al. A randomised, controlled trial of immersive virtual reality analgesia, during physical therapy for pediatric burns. Burns 2011;37(1):61-68. https://doi.org/10.1016/j.burns.2010.07.007

20. Takino M, Itakussu E, Trelha C, Valenciano P, FujisawaD. Physical therapy in infants and preschool children with burns: Retrospective descriptive study. Manual Ther Posturol Amp Rehabil J 2020;1-7. https://doi.org/10.17784/mtprehabjournal.2016.14.367
21. Tang D, Li-Tsang C, Liao L, et al. Functional outcomes of burn patients with or without rehabilitation in Mainland China. Hong Kong J Occup Ther 2015;26(1):15-23. https://doi.org/10.1016/j.hkjot.2015.08.003
22. World Physiotherapy. Impact of the COVID-19 pandemic on physiotherapy services globally. 2020. https://world.physio/sites/default/files/2021-03/Covid-Report_March2021_FINAL.pdf
23. Saha S, Kumar A, Dash S, Singhal M. Managing burns during COVID-19 outbreak. J Burn Care Res 2020;41:1033-1036.
24. Van Niekerk A, Titi N, Lau U, Arendse N. Childhood burns in South Africa: Towards evidence for prevention action and policy. Afr Safety Promotion; J Injury Violence Prevent 2006;4(1):96-108.
25. Morris L, Louw Q, Crous L. Feasibility and potential effect of a low-cost virtual reality system on reducing pain and anxiety in adult burn injury patients during physiotherapy in a developing country. Burns 2010;36(5):659-664. https://doi.org/10.1016/j.burns.2009.09.005
26. Hassem T, Israel N, Bemath N, Variava T. COVID-19: Contrasting experiences of South African physiotherapists based on patient exposure. S Afr J Physiother 2021;77(1). https://doi.org/10.4102/sajp.v77i1.1576
27. Cleland JA. The qualitative orientation in medical education research. Korean J Med Educ 2017;29(2):61-71. https://doi.org/10.3946/kjme.2017.53
28. Heath H, Cowley S. Developing a grounded theory approach: A comparison of Glasser and Strauss. Int J Nurs Stud 2004;41:141-150.
29. Amankwaa L. Creating protocols for trustworthiness in qualitative research. J Cultural Diversity 2016;23(3).
30. World Medical Association. WMA Declaration of Helsinki: Ethical principles for medical research involving human subjects. J Am Med Assoc 2013;310(20):2191-2194.
31. Purcell LN, Sincavage J, Banda W, et al. The effect of burn mechanism on pediatric mortality in Malawi: A propensity weighted analysis. Burns 2021;47;222-227. https://doi.org/10.1016/j.burns.2019.12.018
32. Nthumba PM. Burns in sub-Saharan Africa: A review. Burns 2016;42(2):258-66.
33. Paul A, Adamo M. Non-accidental trauma in pediatric patients: A review of epidemiology, pathophysiology, diagnosis and treatment. Transl Pediatr 2014;3(3):195-207. https://doi.org/10.3978/j.issn.2224-4336.2014.06.01
34. Erickson S, Kim B. Research techniques made simple: Itch measurement in clinical trials. J Invest Dermatol 2019;139(2):264-269. https://doi.org/10.1016/j.jid.2018.12.004
35. Liuzzi F, Chadwick S, Shah M. Paediatric post-burn scar management in the UK: A national survey. Burns 2015;41(2), 252-256. https://doi.org/10. 1016/j. burns. 2014. 10. 017
36. Khadra C, Ballard A, Déry J, et al. Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: a pilot study. J Pain Res 2018;11:343-353.
37. Addab S, Hamdy R, Thorstad K, Le May S, Tsimicalis A. Use of virtual reality in managing paediatric procedural pain and anxiety: An integrative literature review. J Clin Nurs 2022;31(21-22):3032-3059.
38. Jagnoor J, Lukaszyk C, Fraser S, et al. Rehabilitation practices for burn survivors in low and middle income countries: A literature review. Burns 2018;44(5):1052-1064.
39. Arndt C, Davies R, Gabriel S, et al. Covid-19 lockdowns, income distribution, and food security: An analysis for South Africa. Global Food Security 2020;26:100410. https://doi.org/10.1016/j.gfs.2020.100410
40. Haines K, Berney S. Physiotherapists during COVID-19: Usual business, in unusual times. J Physiother 2020;66(2):67-69.
41. Simons M, Kimble R, Tyack Z. Understanding the meaning of trauma-informed care for burns healthcare professionals in a pediatric hospital: A qualitative study using interpretive phenomenological analysis. Burns 2022;48(6):1462-1471. https://doi.org/10.1016/j. burns.2021.10.015
42. Zhu J, Yan W, Zhu L, et al. COVID-19 pandemic in BRICS countries and its association with socio-economic and demographic characteristics, health vulnerability, resources, and policy response. Infect Dis Poverty 2021;10:97. https://doi.org/10.1186/s40249-021-00881-w
43. Rakhmanov O, Demir A, Dane S. A brief communication: Anxiety and depression levels in the staff of a Nigerian private university during COVID-19 pandemic outbreak. J Res Med Dent Sci 2020;8:118-122.

Received 28 November 2023. Accepted 3 July 2024.