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Involvement of Fathers and Siblings in Home Rehabilitation Programmes of Children With Neuro-Developmental Delay: Insights From Rehabilitation Professionals in Bulawayo, Zimbabwe

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ABSTRACT

Background: Neuro-developmental delays (NDDs) present significant challenges for children and families, especially in low- and middle-income countries (LMICs). Full family participation in home rehabilitation programmes is essential for optimal functional outcomes. However, the involvement of fathers and siblings is suboptimal and underexplored. This study investigates the perspectives of rehabilitation professionals on the involvement of fathers and/or siblings in home rehabilitation programmes for children with NDD in Bulawayo, Zimbabwe.

Methods: A qualitative exploratory study was conducted. Data were collected through focus group discussions (FGDs) with 18 rehabilitation professionals. The FGDs were transcribed verbatim, coded, and thematically analysed.

Results: Rehabilitation professionals highlighted the critical role of fathers and siblings in home rehabilitation; noting fathers' emotional support and provision of financial stability and siblings' contributions to social interactions and play therapy. Barriers to involvement included cultural norms and time constraints for fathers, while siblings faced challenges such as limited age-appropriate understanding and the emotional burden of coping with the caregiving role.

Conclusion: According to rehabilitation professionals, involving fathers and siblings seems important for successful home rehabilitation of children with NDD. Addressing cultural and practical barriers to participation requires context-specific strategies, including culturally sensitive community outreach programmes and targeted interventions to promote family-centred care. Such efforts could help overcome these barriers, fostering greater participation of fathers and siblings and enhancing the effectiveness of home rehabilitation within the local context.

Abbreviations: FGDs, focus group discussions; HICs, high-income countries; LMICs, low- and middle-income countries; MoHCC, Ministry of Health and Child Care; NDDs, neuro-developmental delays.

Summary

- Involvement of fathers and siblings in home rehabilitation enhances emotional, financial, and social support, critical for improving outcomes in children with NDD. Their roles extend beyond caregiving to reducing caregiver burnout and fostering family resilience.
- Cultural norms and practical constraints, such as occupational demands for fathers and school commitments for siblings, limit their active involvement. Addressing these barriers requires culturally sensitive and context-specific interventions.
- Knowledge-sharing and training programmes empower fathers and siblings to engage effectively in rehabilitation. Tailored family education sessions improve understanding and reduce stigma, enhancing their contributions to therapeutic practices.
- Family-centred policies should be prioritised to promote inclusive caregiving practices, encouraging active participation of fathers and siblings in NDD rehabilitation. Community outreach programmes can challenge traditional caregiving norms and support systemic changes.
- Further research should explore the direct experiences of fathers and siblings, alongside quantitative studies on the impact of their involvement on rehabilitation outcomes. This will provide a holistic view of family-centred care in low- and middle-income settings.

1 | Introduction

Neuro-developmental delays (NDDs) present significant challenges for children and families, particularly in low- and middle-income countries (LMICs) with limited healthcare resources. NDD includes difficulties in motor, cognitive, communication, social–emotional, and adaptive functioning (Choo et al. 2019; Donald et al. 2014). Many children with NDD require prolonged treatment, which calls for the collaborative involvement of both healthcare providers and family (McNally Keehn et al. 2020). In many contexts, including Africa, caregiving roles, particularly day-to-day responsibilities, are often attributed to mothers. Fathers, while typically not expected to engage in daily caregiving tasks, are often seen as providers of financial support, which is also an essential aspect of caregiving (Ahun et al. 2024). Therefore, the involvement of fathers and, equally significant, the siblings in children with NDD remains under-explored, with research traditionally focusing on the role of mothers as primary caregivers (Moore and Kotelchuck 2004).

Involvement of fathers and siblings is essential for reduced stress for mothers (Cabrera et al. 2018; Sarkadi et al. 2007; Sethna et al. 2017). Siblings contribute by improving social interactions in the family and support a holistic family-centred approach to caregiving (McHale et al. 2012). While family support is known to be beneficial, there is a critical gap in research on family involvement in rehabilitation within LMICs, including Zimbabwe (Diniz et al. 2021; Roksa and Kinsley 2019).

MenEngage Africa Alliance (2023) observes that the role of fathers and siblings in caregiving within Zimbabwe is often shaped by cultural norms that assign these responsibilities to women. This apparent socio-cultural gender expectation limits the direct participation of fathers in caregiving for children with NDD to the role of being financial providers only. Similarly, Cherry (2024) highlights that siblings, particularly girls, often bear a disproportionate caregiving burden while managing their personal responsibilities. This phenomenon, sometimes referred to as 'eldest daughter syndrome', illustrates the high expectations and pressures faced by eldest female children, who frequently assume significant caregiving and household responsibilities from an early age compared with their male counterparts.

Understanding the involvement of fathers and siblings in home rehabilitation programmes for children with NDD is critical. Rehabilitation professionals, who work closely with families, are well-positioned to offer insights into the influential factors that facilitate or else create barriers to family engagement in home-based rehabilitation programmes (Fogarty et al. 2022). Healthcare professionals, particularly rehabilitation practitioners, possess a unique vantage point, as they work at the intersection of clinical care and family engagement. They not only observe but also actively influence family dynamics and care patterns over time, positioning them as key agents in promoting family-centred care (Boelsma et al. 2021; Jeong et al. 2021; Shields and Synnot 2016).

Previous research has highlighted the significant role rehabilitation professionals play in shaping inclusive care strategies, particularly in settings where family involvement is crucial for successful outcomes (Ryan et al. 1996). However, while their insights have informed policy shifts and the implementation of family-centred models in high-income countries (HICs), particularly in the United States, limited evidence exists regarding their impact in LMICs such as Zimbabwe. This study seeks to bridge the gap by exploring the perspectives of rehabilitation professionals on the involvement of fathers and siblings in home rehabilitation programmes for children with NDD in Zimbabwe. The study focuses on their roles, the factors influencing family engagement, and the impact on rehabilitation outcomes, with the aim of providing actionable insights to enhance family-centred care practices.

2 | Methods

2.1 | Study Design

This exploratory qualitative study aimed to capture the perspectives of rehabilitation professionals regarding their interactions with families in the facilitation and support of home-based neurodevelopmental programmes. Rather than focusing on the direct lived experiences of families, the study gathered insights from the rehabilitation experts pertaining to their observations of family dynamics over time as they worked closely with these families in prescribing home rehabilitation programmes. Gaining insights from the perspectives of healthcare professionals can immensely contribute towards advancing family-centred rehabilitation (Boelsma et al. 2021). Focus group discussions (FGDs) were used to elicit their insights and views. Healthcare professionals openly shared their opinions and were encouraged to highlight their observations about families that had children with NDD that they had previously assisted or facilitated (Creswell and Poth 2018; Rodriguez and Smith 2018; Smith et al. 2022).

2.2 | Study Site

The research was conducted at two tertiary hospitals that provide specialised care to patients with NDD from district level and provincial level hospitals, in the Bulawayo Metropolitan Province of Zimbabwe. These two tertiary hospitals also function as referral healthcare centres, providing specialised care to patients for the middle and southern parts of Zimbabwe. As the largest centres for neuro-developmental care in the southern region of the country, these two hospitals were strategically important to explore the perspectives and experiences of rehabilitation professionals on supporting and facilitating services associated with NDD in Zimbabwe (Madzimbe and Potterton 2023; MoHCC 2013).

To protect and respect the ethical confidentiality of the rehabilitation professionals as participants, the two hospitals they work from are not named. Over 50% of rehabilitation professionals participated in these two sites, hence disclosing institutional names could risk identifying the individuals. Anonymity allows for open sharing on sensitive institutional practices and any other sensitive issues discussed, aligning with ethical standards.

2.3 | Study Population and Sampling

Across the two research sites, 34 rehabilitation healthcare professionals were identified as the population of the study. Specifically (occupational therapists [$n=4$], physiotherapists [$n=13$], and rehabilitation technicians [$n=17$]), 18 rehabilitation healthcare professionals (52.9%) were purposively sampled to be recruited into two separate focus groups. The rehabilitation healthcare professionals selected consisted of occupational therapists ($n=3$), physiotherapists ($n=5$), and rehabilitation technicians ($n=10$). This sample size was adequate for ensuring data richness and saturation, typical of qualitative studies (Hennink et al. 2017; Polit and Beck 2020). Rehabilitation technicians hold a certificate or a diploma in rehabilitation and are trained in multiple disciplines, including physiotherapy and occupational therapy. All 18 rehabilitation healthcare professionals invited to participate accepted the terms of being a part of the FGDs. Data saturation was monitored to ensure diverse perspectives were captured. Predetermined inclusion and exclusion selection criteria for participants are presented in Table 1.

2.4 | Data Collection Methods and Tools

Data were gathered through FGDs using a semi-structured group interview guide (see Additional file 2). The questions focused on the experiences and observations of the rehabilitation healthcare professionals in their involvement with home rehabilitation programmes for children with NDD. Prior to conducting the study, the lead author (PM) conducted a pilot study with six rehabilitation professionals to refine the questions and practice capturing field note taking. The results from the pilot study were excluded from the main analysis to prevent bias, as it primarily refined the probing questions and field note-taking protocol, ensuring only data collected under consistent conditions contributed to the main analysis. The discussions

TABLE 1 | Inclusion and exclusion criteria for FGDs participant.

Inclusion criteria	Exclusion criteria
• Qualified medical rehabilitation professionals working at either of the two selected referral hospitals in Bulawayo and registered with the Medical Rehabilitation Practitioners Council of Zimbabwe. • Rehabilitation professionals who have attended to children with NDD in the presence of their fathers and siblings for at least 1 year. • Rehabilitation professionals who gave their consent to participate.	• Rehabilitation professionals who were sick or incapacitated during data collection. • Rehabilitation professionals who have not been actively practicing in paediatric rehabilitation for at least 6 months prior to the study. • Rehabilitation professionals who were involved in the pilot study to avoid data redundancy and potential bias.

Note: This table outlines the specific criteria used to include or exclude participants in the focus group discussions (FGDs). It specifies the qualifications, professional experience, and scope of involvement with children with NDD required for participation.

were held separately at the two tertiary hospitals and lasted 45 and 38 min for the two groups. Data saturation was reached by the end of the second FGD. The FGDs were recorded with a voice recorder supported with password protection, and field notes were taken to capture participant demographics (in the first stage of self-introductions of participants which was not recorded to ensure participants remain anonymous in the recordings), nonverbal cues, group dynamics, and key observations during the FGDs. Data saturation was reached as no new themes or sub-themes emerged in the final focus group, confirming the comprehensiveness of the data collected.

Prior to data collection, this study received ethical approval from University of Cape Town Human Research Ethics Committee (Approval No. 482/2023) and the Medical Research Council of Zimbabwe (Approval No. MRCZ/A/3100). Written permission was granted by the Clinical Directors of both hospitals, and participants provided written informed consent. During the study, all procedures performed in studies involving human participants were in accordance with the ethical standards of the Institutional Research Committee and with the 1964 Helsinki declaration and its latest amendment (Madzimbe and Potterton 2023). The study ensured rigour in qualitative reporting by adhering to Consolidated Criteria for Reporting Qualitative Research (COREQ) standards (Tong et al. 2007) (see Additional File 1).

2.5 | Data Management and Analysis

Data from the FGDs were transcribed, coded as illustrated in Table S1, and thematically analysed using NVivo12 (QSR International 2021). The lead author (PM) and two independent coders (GM and VT) reviewed the transcripts to ensure accuracy and familiarity with the data. The FGD transcripts were also shared with participants for their verification (member checking). Post FGDs, the inductive approach was applied to identify themes and sub-themes (Delve and Limpaecher 2024; Nowell et al. 2017). Field notes were analysed alongside the transcripts to capture both verbal and nonverbal data. Multiple coders were used to mitigate bias and enhance the credibility and trustworthiness of the data.

2.6 | Trustworthiness of the Study

The trustworthiness of qualitative research studies is ensured through credibility, dependability, confirmability, transferability, and reflexivity (Korstjens and Moser 2018; Nowell et al. 2017; Statistics Solutions 2018). Credibility was enhanced by member-checking and using direct quotes to illustrate themes. Dependability was maintained through a consistent analysis protocol, while confirmability relied on audio recordings and independent coding. Detailed descriptions of the study context ensured transferability. Reflexivity was continuously applied, with researchers reflecting on their influence during the FGDs and using independent coders to maintain objectivity.

3 | Results

Eighteen rehabilitation professionals participated with age ranging from 25 to 63 years and having 1–36 years of healthcare professional experience, with balanced gender distribution across groups. All participants contributed up to the end of the FGDs. Demographic details of participants from both FGDs are presented in Table 2.

3.1 | Thematic Analysis of Data

3.1.1 | Objective 1: To Examine the Roles and Contributions of Fathers and Siblings in Providing Home Rehabilitation Programmes for Children With NDD, as Perceived by Rehabilitation Professionals

Rehabilitation healthcare professionals collectively recognised the importance of engaging both fathers and siblings in the rehabilitation of children with NDD. The general consensus also attested to the involvement of fathers and siblings in contributing immensely to the psychosocial support and offering practical support to both the child and the primary caregiver—the mother. Two themes emerged from the data:

1. fathers as emotional and practical supporters

TABLE 2 | Demographics of participants.

Focus groups	Number of participants	Female participants	Male participants	Participant types	Qualifications	Age range (years)	Work experience range (years)
FGD1	10	6	4	Rehabilitation technicians ($n=8$) Physiotherapists ($n=2$)	Certificate in rehabilitation, BSc (Hons) in Physiotherapy	26–63	1–36
FGD2	8	5	3	Rehabilitation technicians ($n=2$) Physiotherapists ($n=3$) Occupational therapists ($n=3$)	Certificate in rehabilitation BSc (Hons) in Physiotherapy BSc (Hons) in Occupational Therapy	25–59	1–34

Note: This table presents demographic details of the 18 rehabilitation professionals who participated in the FGDs, including their professional roles, qualifications, age range, and years of work experience.

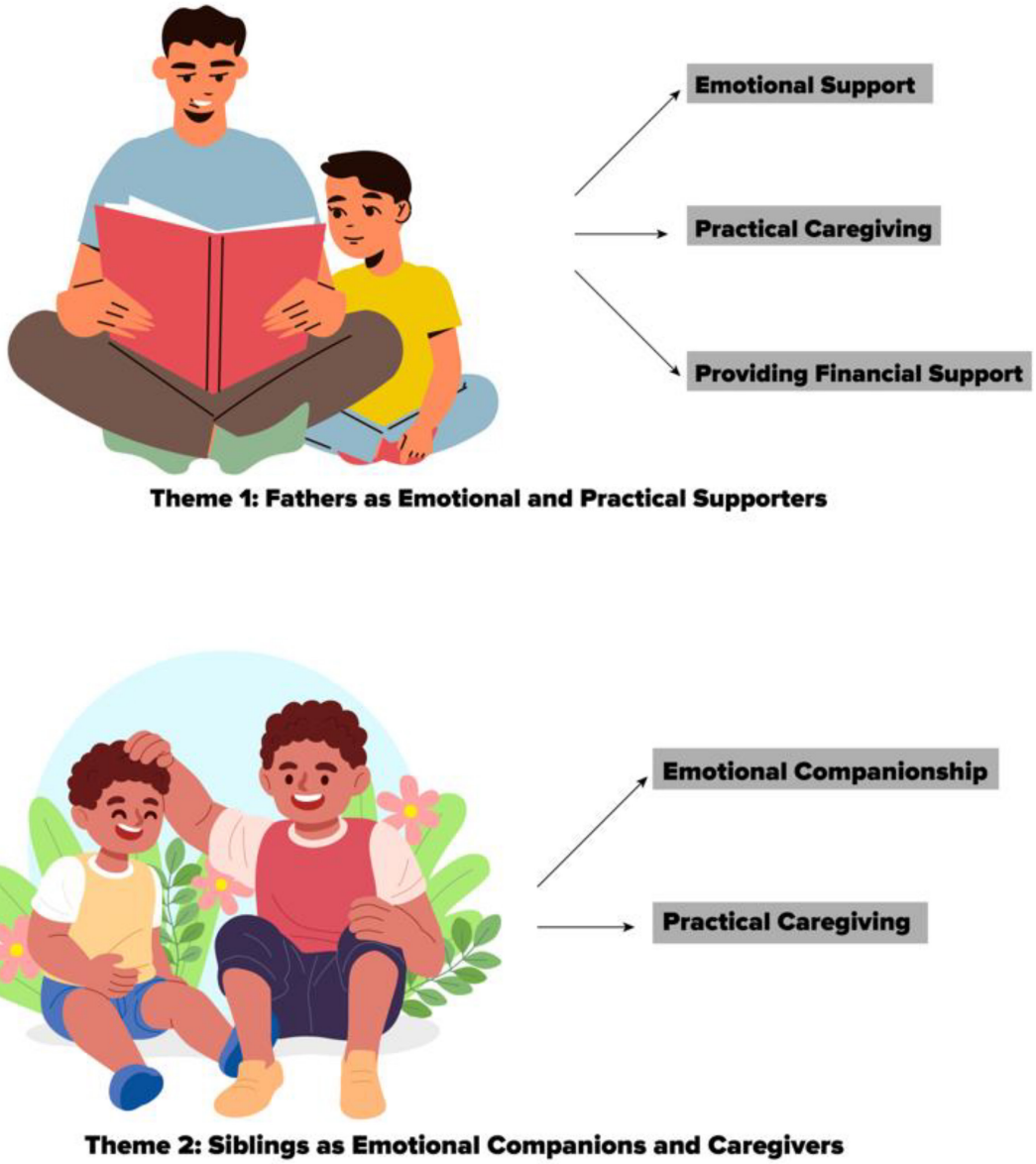

FIGURE 1 | Roles of fathers and siblings in emotional and practical support. *Source*: All cartoons are attributed to the website https://www.freepik.com under the free licence policy. Most were edited, while some were used in their original form in accordance with the free licence terms. This figure illustrates the thematic analysis of the roles played by fathers and siblings in the emotional and practical support of children with neuro-developmental delay (NDD). The roles are categorised under two primary themes: "fathers as emotional and practical supporters" and "siblings as emotional companions and caregivers." Subthemes include emotional support, practical caregiving, and play therapy.

2. siblings as emotional companions and caregivers.

The themes and sub-themes for Objective 1 are summarised in Figure 1; these are presented subsequently in detail.

3.1.2 | Theme 1: Fathers as Emotional and Practical Supporters

Fathers play a pivotal role in the rehabilitation of children with NDDs, serving as both emotional and practical pillars of support. One of the most significant aspects of this role is the emotional support they provide, which is crucial for the well-being of both the child and the primary caregiver, typically the mother. One healthcare professional emphasised the importance of moral support, stating, 'Fathers or siblings or the whole family play an important role in the rehabilitation of these children with neuro-developmental delays because the mothers ... need moral support in taking care of the baby' (FGD1-P3). This emotional backing not only strengthens the mother's resilience but also fosters psychological stability within the family. Another participant highlighted how fathers' emotional presence helps reduce caregiver burnout, explaining, 'This helps in giving the mother psychological support. It gives the mother a sense of relief that she is not alone in this' (FGD1-P4). Such emotional involvement contributes significantly to a more cohesive and supportive family environment.

In addition to the emotional support, fathers also provide practical caregiving, which plays a crucial role in maintaining the day-to-day continuity of care for the child. One discussant remarked, 'They can take turns in taking the child for sessions' (FGD1-P6),

illustrating how fathers can share the physical demands of caregiving. Another healthcare professional noted that while mothers often attend hospital visits and receive exercise programmes, fathers who step in at home contribute meaningfully by assisting with the prescribed activities. This sentiment was echoed in the comment, 'I think with fathers they are important; their role is very important in that when the principal caregiver is not able maybe because they are busy [or when] they are burnt out, they can help out with exercises' (FGD2-P14). By participating in practical caregiving, fathers alleviate the physical burden on mothers, ensuring consistent therapeutic engagement for the child.

Beyond emotional and practical caregiving, fathers often assume the role of financial providers, which is indispensable in supporting the rehabilitation process. A participant observed, 'Usually we see the mothers coming to the hospital with the baby, so it becomes difficult for someone who was at home to do the exercises because they were not there when they were given the programme so usually they are more of financial and moral support side' (FGD1-P1). Financial contributions from fathers enable the purchase of necessary items, such as toys and equipment, which facilitate the child's developmental progress. Another participant reinforced this, stating, 'I think their role is very important in cases where some mothers they feel that sometimes they have to drop from work [sic] when they have children with developmental issues, so they are very important in providing financial resources' (FGD2-P10). These remarks underline the indispensable financial role fathers play, ensuring that critical resources are available to support the child's rehabilitation journey.

3.1.3 | Theme 2: Siblings as Emotional Companions and Caregivers

Siblings as emotional companions and caregivers play a crucial role in the child's rehabilitation process, offering emotional companionship that enhances the therapeutic experience. One healthcare professional noted, 'Older siblings they can have play therapy in the exercise session [of a child with NDD], and it will not be boring for the child because they are playing' (FGD2-P18), highlighting how sibling involvement reduces the child's anxiety during therapy. Another added, 'It creates [a] bond between siblings as they took [sic] turns in participating in therapy. Their roles are important both at home and at the clinic level' (FGD2-P9), emphasising their dual role in supporting both the child and the overall rehabilitation process. The holistic role of sibling involvement was further reinforced by the statement, 'I think the involvement of other siblings and fathers is very important because in the care of a child with developmental delays, you need to be helped, physically, spiritually, psychologically so as to avoid burnout' (FGD2-P15).

Siblings also play a vital role in practical caregiving, contributing significantly to the child's day-to-day management and safety. Sibling engagement in play therapy is particularly effective, as noted: 'The siblings, I think they are very effective, as we can achieve what we want through play' (FGD2-P11). Additionally, siblings help protect the child, with one participant stating, 'If the other siblings know about the condition, the accidents that happen to that child are less because they are well aware of his limitations' (FGD2-P17). This demonstrates their role in creating a safer environment for the child and actively supporting their rehabilitation process.

3.1.4 | Objective 2: To Identify the Key Facilitators and Barriers That Influence the Involvement of Fathers and Siblings in Home Rehabilitation Programmes for Children With NDD, From the Perspective of Rehabilitation Professionals

Rehabilitation professionals identified several barriers and facilitators that influenced the extent of involvement by fathers and siblings in the home-based rehabilitation of children with NDD. Two themes emerged:

1. facilitators for involvement
2. barriers to involvement.

The themes and sub-themes (six for fathers and four for siblings) for Objective 2 are summarised in Figure 2; these are presented subsequently in detail.

3.1.5 | Theme 1: Facilitators for Involvement

A key facilitator for involving fathers was increasing their knowledge about the NDD condition diagnosed for their child. One professional explained, 'It's very important for them to be involved in the causes of the condition especially in Africa where there will be some blame games, where the father will blame the wife, so it is important for them to be involved' (FGD2-P15). Understanding the condition helps eliminate misconceptions and promotes a supportive home environment. In line with this, another participant noted, 'If they really understand there is good understanding of the problem, the support system will be very strong and there won't be any blame game as has just been said' (FGD2-P11). This was supported by the need to have training programmes to enhance awareness as one participant said, 'I guess if we revive outreach programmes and we also invite spouses when they come in, just before we start our treatments we just give them a lecture, I guess it will facilitate' (FGD1-P1). To support this, one participant said, 'When both partners have the insight of the condition there will be less fight [sic] at home, otherwise they will end up in divorce'. (FGD1-P3).

For siblings, their involvement in family discussions about the child's condition proved vital. 'The siblings are also able to reduce themselves to the level of the child involved' (FGD2-P11), noted one participant, highlighting the adaptive nature of siblings in responding to the needs of their sibling with NDD. Another professional remarked, 'If that child was involved not just at the home setting, [but] also in the rehabilitation programme, they are motivated to help their siblings' (FGD2-P15). These insights suggest that when family members, including siblings, are informed and involved, they contribute more effectively to the child's care.

Overall, rehabilitation healthcare professionals collectively agreed that the acceptance of the child's health condition by

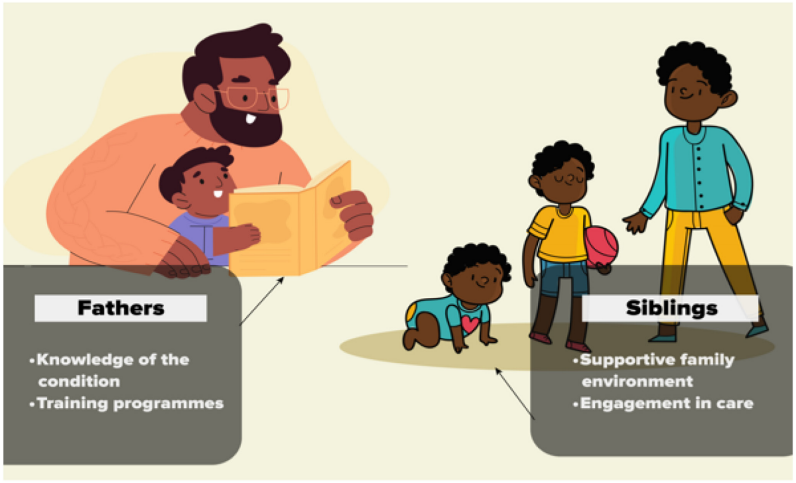

FIGURE 2 | Facilitators and barriers to involvement for fathers and siblings. *Source*: All cartoons are attributed to the website https://www.freepik.com under the free licence policy. Most were edited, while some were used in their original form in accordance with the free licence terms. This figure highlights the key facilitators and barriers to the involvement of fathers and siblings in home rehabilitation. Facilitators include knowledge-sharing and family discussions, while barriers focus on cultural norms, religious beliefs, and time constraints.

fathers and siblings could positively influence their active participation in home-based rehabilitation, enhance their caregiving roles, and foster a more collaborative approach to childcare.

3.1.6 | Theme 2: Barriers to Involvement

Cultural and religious norms were a significant barrier to the involvement of fathers. One professional remarked, 'In our culture, I have observed that the fathers are a bit reluctant to take care of a child be it a normal child because they think that duty is [reserved] for mothers' (FGD2-P12). Another discussant said, 'Religious beliefs can also [have] influence; some churches do not allow people to go to hospitals and make it very difficult' (FGD1-P6). Such religious beliefs restrict the roles of fathers to participate in hospital prescribed home-based rehabilitation whilst further reinforcing traditional caregiving role to the mother. Another participant supported this, noting, 'When it now comes to a child with a neurodevelopmental condition the mother will have the sole duty of taking care of the child which in the end will burn her out' (FGD2-P15). Social stigma and poor stress management were also mentioned as barrier by one of the discussants who said, 'The siblings and father have poor understanding of the child and the condition. They may end up discriminating [against] the child, like in the case when [sic] one child killed [their sibling] because they did not really understand the child. Eventually, they start feeling like [the child] is disturbing them in certain ways, so they end up discriminating [against] them'. (FGD2-P18).

Occupational commitments by fathers and school schedules for siblings impacted on the time they spent to participate in home rehabilitation programmes, and these were identified as barriers to participation. One participant said, 'From experience, if you ask them where the fathers are, they will always say he is at

work so fathers are busy' (FGD1-P2). Another participant said, 'Siblings will be at school, so [it is difficult] for them to be [fully] involved in the health of the child. The siblings have to go to school and then they have extra lessons, the time will be so little' (FGD2-P9).

For siblings, lack of understanding due to young age was the primary barrier. Younger siblings were often too immature to understand their role in the care process. As one professional explained, 'For siblings, one of the barriers can be age, if the sibling is [too] young no matter how much you try to explain they will not understand' (FGD2-P10). This indicates the importance of tailoring involvement strategies based on the maturity and comprehension level of siblings.

3.1.7 | Objective 3: To Explore How the Involvement of Fathers and Siblings in Home Rehabilitation Programmes Influences Rehabilitation Outcomes for Children With NDD, According to Rehabilitation Professionals

The roles of fathers and siblings extends beyond simple caregiving. They complement professional care through both practical and emotional contributions. The roles of fathers and siblings were further explored through two central themes:

1. practical complementary actions
2. emotional and social support

The themes and sub-themes for Objective 3 are summarised in Figure 3; these are presented subsequently in detail.

3.1.8 | Theme 1: Practical Complementary Actions

Fathers and siblings are key contributors to the successful implementation of home rehabilitation programmes. One professional noted, 'Fathers or siblings or the whole family play an important role … because the mothers … need moral support in taking care of the baby' (FGD1-P3). Fathers' involvement in executing therapy routines is essential for continuity of care, with one stating, 'If you get them involved, it makes our programme more effective' (FGD1-P7). Siblings, particularly older ones, also assist with practical tasks like feeding, play, and mobility exercises, providing essential support: 'Siblings … assist practically by making sure the child does not feel neglected' (FGD1-P7).

3.1.9 | Theme 2: Emotional and Social Support

The provision of psycho-social support was a predominant theme that was echoed by discussants from both groups. In this case, fathers and siblings were considered to be a vital cog in the delivery of emotional and social support, which would in turn strengthen therapeutic outcomes for children with NDD. Fathers and siblings played an equally important role in providing emotional support, reducing the burden on the primary caregiver. A professional explained, 'It is important

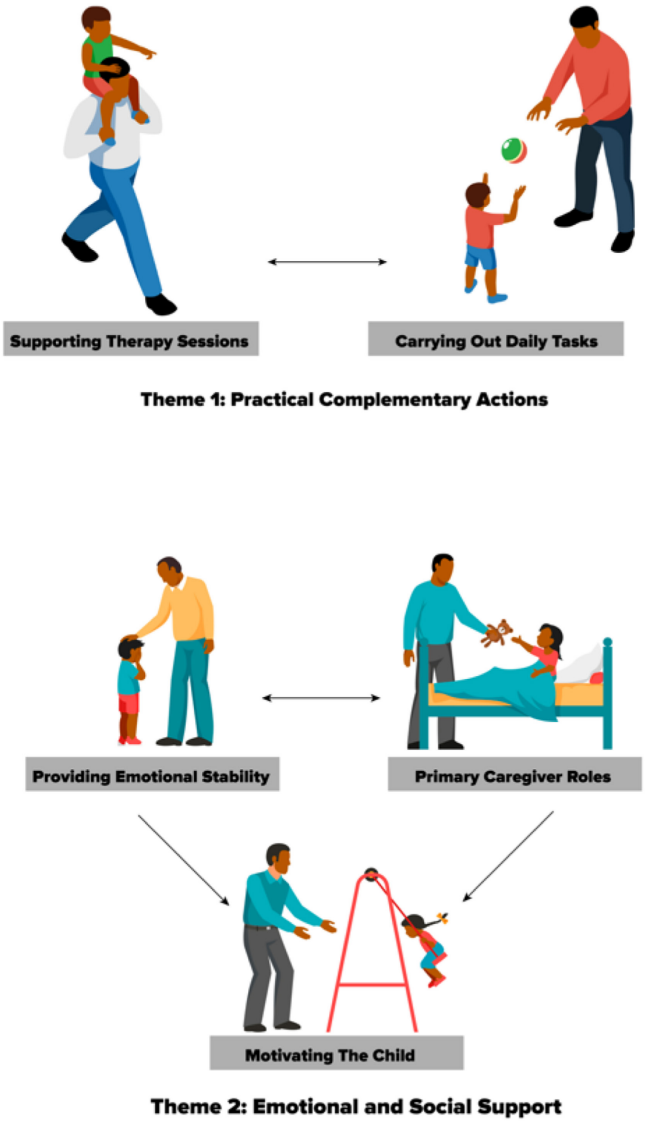

FIGURE 3 | Practical and emotional support roles in childcare. *Source*: All cartoons are attributed to the website https://www.freepik.com under the free licence policy. Most were edited, while some were used in their original form in accordance with the free licence terms. The figure provides an overview of the complementary actions and emotional/social support provided by fathers and siblings in home rehabilitation. It emphasises the significance of their roles in enhancing therapeutic outcomes and family well-being.

to lessen the burden of the mother, both emotionally and physically' (FGD2-P15), while another added, 'If the father shows that they care … the child feels good about themselves' (FGD2-P11). Siblings contribute by creating a positive, playful environment during therapy that will enhance rehabilitation outcomes: 'It creates a bond between siblings as they take turns in participating in therapy' (FGD2-P17).

Moreover, their involvement helps prevent caregiver burnout, as one professional noted, 'The role of the spouse and siblings … helps the principal caregiver to share—to reduce burnout' (FGD2-P9). This shared responsibility fosters emotional resilience within the family, making the rehabilitation process more sustainable.

Detailed codes, descriptions, and illustrative codes in the data analysis for the three objectives of this study are presented in Table S1 (See additional file 3).

4 | Discussion

This study sought to explore the perspectives of rehabilitation healthcare professionals pertaining to the involvement of fathers and siblings in home rehabilitation programmes for children with NDD in Zimbabwe. The study focused on their roles, barriers, facilitators, and the impact on rehabilitation outcomes, with the aim of providing actionable insights to enhance family-centred care practices. The findings revealed that fathers and siblings have a critical role in home rehabilitation, noting emotional support from fathers and provision of financial stability while siblings contributed through social interactions and play therapy. Barriers to involvement included cultural norms and occupational time commitments for fathers, while siblings faced challenges such as limited age-appropriate understanding and the emotional burden of coping with the caregiving role.

Rehabilitation healthcare professionals consistently acknowledged the value of engaging fathers as co-therapists. Fathers can actively participate in therapeutic activities alongside the healthcare providers and help reinforce the conduct of exercises and caregiving interventions at home. This collaborative role not only strengthens the therapeutic process but also contributes to improved developmental and social–emotional outcomes for children. This finding aligns with existing research, which highlights the positive influence of paternal involvement on child development (Cabrera et al. 2018; Sarkadi et al. 2007; Sethna et al. 2017). Expanding the role of fathers as co-therapists offers a practical avenue for enhancing family-centred rehabilitation approaches. Notably, this study also reaffirms the participation of fathers to be crucial towards alleviating the maternal stresses of caregiving, a finding echoed by Black et al. (2017) and Nomaguchi et al. (2017) who further highlighted the value of a balanced caregiving approach.

Similarly, siblings were recognised as vital contributors to the caregiving structure. Their involvement helped reduce the pressure on parents and fostered a sense of companionship and normalcy for children with disabilities as supported by previous studies (Lynam and Smith 2021; McHale et al. 2012). Furthermore, this study suggests that siblings who are well-informed about the child's condition play a pivotal role in promoting a conducive and inclusive home environment that is critical for successful rehabilitation. This is also well confirmed by previous studies (Iadarola et al. 2019; Lynam and Smith 2021).

Despite the recognised benefits attested by this study, sociocultural and religious norms remain significant barriers to the involvement of fathers and siblings in caregiving. The prevalent view that caregiving is primarily a maternal role limits fathers' engagement, reinforcing an unequal distribution of caregiving responsibilities (Engle et al. 2011, Madzimbe et al. 2024). This barrier is compounded by the economic disposition of men being constrained to be providers for the family and have to commit to work schedules that limit their home involvement. This is a prevalent finding for working men in low-income contexts (Madzimbe et al. 2024; Research and analysis 2021).

For siblings, their ability to contribute effectively to caregiving is often shaped by their age, as seen in this study. Younger siblings may lack the necessary maturity or understanding, while older siblings may face emotional fatigue from the demands of caregiving, leading to strain over time (Chukwu et al. 2019; Leane 2020). To address these challenges, rehabilitation professionals can provide age-appropriate support, such as engaging educational activities for younger siblings to foster empathy and understanding, and counselling or peer support groups for older siblings to prevent caregiver burnout. By implementing such family-centred support mechanisms, siblings can be better equipped to fulfil their roles without compromising their own emotional well-being (Kroner et al. 2018).

The findings of this study suggest important implications for clinical practice. Rehabilitation healthcare professionals consistently highlighted the importance of integrating fathers and siblings into the family education on rehabilitation strategies for children with NDD to ensure that caregiving responsibilities are equitably distributed, and their roles of support are recognised and emphasised among the family members. Research supports this approach, with family-centred care shown to improve not only therapeutic outcomes for the child but also family dynamics and primary caregiver well-being (Arnold et al. 2012). The study also highlights the unique challenges in engaging fathers and siblings compared with mothers, suggesting that rehabilitation healthcare providers should receive additional training that is focused on overcoming the barriers and promoting the facilitators to the participation of fathers and siblings as family members in their local contexts. Immediate intervention in the form of workshops can be effective as well as integrating these aspects into the physiotherapy curricula would support a more family-centred approach and ultimately contribute more successfully to home rehabilitation outcomes for children with NDD (Baran and Sawrikar 2024).

Community outreach programmes play a crucial role in enhancing the involvement of fathers and siblings in the care of children with NDD, particularly in deeply cultural and religious communities. These programmes not only raise awareness about NDD but also promote inclusive caregiving practices, fostering greater acceptance and support for families undergoing rehabilitation. A scoping review by Madzimbe et al. (2024) highlights the significance of engaging fathers and siblings in home rehabilitation programmes, noting that cultural beliefs and economic constraints often limit their participation, increasing stress on mothers and hindering developmental outcomes. Rehabilitation professionals in this study emphasised that bridging awareness gaps through targeted outreach can foster active family involvement. Public health campaigns and culturally sensitive initiatives can challenge traditional norms and beliefs, promoting shared caregiving responsibilities and addressing barriers to family engagement (Pharr et al. 2014).

On a policy level, this study stresses the need for family-centred policies that support and recognise the inclusion of fathers and siblings in home-based caregiving programmes. While this

study did not collect direct data from the families, the professionals underscored the value of targeted interventions backed by healthcare policies to enhance family involvement. The findings from this study further support that family-centred approaches rather than solely patient-centred care can improve the effectiveness of home-based rehabilitation efforts.

A key strength of this study lies in the use of FGDs, which provided in-depth insights from rehabilitation healthcare professionals across multiple disciplines (physiotherapists, occupational therapists, and rehabilitation technicians) from two major referral hospitals that play a pivotal role in delivering specialised care and shaping rehabilitation practices within Zimbabwe's healthcare system. This study was further strengthened by a high participation rate of 52.9%. The focus group discussants represented a range of professional backgrounds, providing broad demographic insights and extensive experience in prescribing home rehabilitation programmes, their practice in outpatient clinics, and the value of engaging in community outreach programmes and home visits. This diversity provided a strong foundation for exploring the perspectives of rehabilitation professionals on neuro-developmental practices and led to a well-rounded understanding of family involvement in rehabilitation.

This study has several limitations. The tertiary nature of the healthcare centres where the study participants work may influence the findings and limit generalisability to other healthcare settings. While qualitative research aims to explain phenomena or generate theory through in-depth insights, the findings are based solely on the perspectives of rehabilitation healthcare professionals in Zimbabwe. These professionals offer a unique vantage point on family involvement in home-based care, as they play a critical role in promoting, facilitating, and guiding interventions, as well as reporting to government bodies for policy monitoring and evaluation. However, the exclusion of other key professionals, such as social workers and community health workers, limits the study's ability to present a holistic view of family-centred care. Moreover, the absence of direct input from family members, including mothers alongside fathers and siblings, leaves a gap in understanding the lived experiences and challenges of caregiving. Future research should address these gaps by engaging both family members and a broader range of professionals to provide a more comprehensive understanding of the dynamics influencing caregiving in home settings. Future researchers should also investigate whether girls and boys engage differently in terms of the frequency and/or nature of engagement with a sibling with NDD. Additionally, future researchers should quantitatively explore the comparative outcomes of home rehabilitation programmes with and without the involvement of fathers and siblings, examining the specific impact of their support on the child's developmental progress and overall family well-being. This could provide valuable insights into the distinct roles of fathers and siblings in enhancing rehabilitation outcomes and fostering a more supportive family dynamic.

The study successfully integrated the findings from rehabilitation professionals engaged in home rehabilitation programmes for children with NDD. The study has also emphasised the vital role of fathers and siblings in the home-based rehabilitation of children with NDD, affirming their importance in achieving positive therapeutic outcomes and fostering family well-being (Madzimbe et al. 2024). Despite the ongoing challenges posed by cultural norms and practical barriers, it is clear that targeted interventions and a shift in societal attitudes can greatly enhance family participation. According to Molyneux et al. (2012), family members play a crucial role in supporting healthcare needs, especially in settings with limited access to healthcare professionals, where family caregiving can bridge significant gaps in continuity and quality of care. Therefore, the dual roles of fathers and siblings offer great potential for home rehabilitation programmes to succeed for children living with NDD, particularly in LMICs like Zimbabwe.

5 | Conclusion

The findings of this study underscore the significant role of fathers and siblings in home rehabilitation programmes for children with NDD. Fathers provide crucial emotional and financial support, while siblings enhance the caregiving dynamic through play therapy and companionship. Despite these benefits, cultural and economic barriers limit their engagement, highlighting the need for targeted interventions to foster their involvement.

Rehabilitation healthcare professionals play a pivotal role in facilitating family-centred care, and their insights offer practical strategies for enhancing the participation of fathers and siblings. Community outreach and policy reforms are necessary to address systemic barriers and promote inclusive caregiving practices. Future research should aim to include direct perspectives from families to provide a holistic understanding of the caregiving experience.

Author Contributions

Precious Madzimbe: conceptualisation, data collection, analysis, drafting manuscript. **Jermaine Dambi:** supervision, methodological guidance, data analysis, critical revision. **Lieselotte Corten:** supervision, literature review, manuscript review. **Soraya Maart:** supervision, literature review, manuscript review. All authors reviewed and approved the final manuscript.

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Ethics Statement

Ethical approval was obtained from the University of Cape Town (Approval No. 482/2023) and the Medical Research Council of Zimbabwe (Approval No. MRCZ/A/3100). All participants signed a written informed consent prior to participation. Pictures used are licence free; hence, no permission was required as per the licence free policy.

Conflict of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Coded data transcripts are available as supplementary material.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.