BARRIERS AFFECTING CLUBFOOT TREATMENT IN SARAWAK

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Abstract

Background: Congenital talipes equinovarus (CTEV), also known as clubfoot is the most common lower limb congenital deformity among paediatric patients. The outcome of starting clubfoot treatment early is very promising. Patient retention throughout the treatment programme is challenging in Sarawak. In this study, we explored the barriers that parents/caregivers face when seeking clubfoot treatment in Sarawak, Northwest Borneo. A better understanding of the barriers will provide us with the information to formulate effective programmes for clubfoot treatment in this region.

Methods: We conducted a questionnaire-based quantitative cross-sectional descriptive survey. We adapted a set of closed-ended questionnaires originally designed by Kazibwe and Struthers in a study done in Uganda in the year 2006.

Results: A total of 53 parents/caregivers of children with idiopathic clubfoot were recruited in this study, with 16 defaulter cases and 37 non-defaulter cases. We found 2 statistically significant barriers to clubfoot treatment in Sarawak, with p-value < 0.05, namely the geographical factor (p = 0.019) and logistic factor (p = 0.017).

Conclusion: Barriers to clubfoot treatment that influence the compliance to treatment identified in this study are long distance travel, logistics limitations, uncooperative patients during treatment, parents/caregivers having other commitments, unsupportive family members, lack of understanding regarding clubfoot and its treatment, inadequate specialists in clubfoot, traditional socio-cultural beliefs and practices and economic constraints. Enhanced understanding in this matter will guide us in devising culturally admissible ways to increase awareness in parents/caregivers regarding clubfoot and its treatment. A sustainable national clubfoot program will be very beneficial in providing a holistic approach to tackle barriers to treatment in our country.

Keywords : Barriers, Congenital Talipes Equinovarus, Clubfoot, Treatment

Introduction

Clubfoot is also referred to as congenital talipes equinovarus (CTEV). It is one of the most common congenital lower limb deformities among paediatric orthopaedic patients (1-4). In CTEV, the hindfoot is adducted, flexed and inverted and the forefoot is pronated, giving it the accentuated concavity of the plantar arch (5).

The reported incidence of clubfoot worldwide, varies from 0.39 to 7.0 per 1000 live births (3,4,6-8). In Malaysia, the incidence of clubfoot cases is about 4.5 per 1000 live births

(1). CTEV has male predilection with males affected twice more frequently than females (6,9,10). However, gender preponderance is not seen in Malaysia (1).

The Ponseti Method is the gold standard conservative treatment for clubfoot (11). The technique is a low-technology approach that incorporates gentle manipulation, gradual correction with serial weekly casting and minimally invasive percutaneous tendo achilles tenotomy (11,12). The outcome of starting clubfoot treatment early is very promising as the deformity is correctable, resulting in painfree foot that has near normal function (13-15).

Most of the studies on barriers in seeking clubfoot treatment were conducted in other countries, such as Uganda, Malawi, China and Vietnam (16-20). A similar study as ours, carried out in Uganda, evaluated the obstacles faced by parents during the plaster-casting treatment phase (19). Another group of authors explored the factors that affect the treatment-seeking behaviour of parents/caretakers of children receiving clubfoot treatment in Malawi (16,17). In China, Lu et al. studied the barriers affecting the treatment of clubfoot from the perspectives of parents/caregivers and healthcare staff (20). One Vietnam-based study examined the factors affecting the treatment of clubfoot during the development of the clubfoot program in the country (18). The aforementioned studies on the barriers to clubfoot treatment done in different parts of the world involved diverse ethnicities, cultures and local settings. The findings from the studies revealed that patients are faced with almost similar adversities when seeking treatment. The researchers have classified the barriers into several themes, viz., patient factor, family factor, socio-cultural factor, economic factor, doctor/healthcare personnel factor, geographical factor and logistics factor (16-20).

To date, there is no study on the barriers affecting the adherence to clubfoot treatment in Sarawak, Northwest Borneo. With only two referral centers offering clubfoot treatment for a population of 2.63 million (21) in Sarawak, patients from all over the state have to travel a great distance to seek treatment. We undertook this study to examine the breadth and depth of challenges encountered by the parents/caregivers during the treatment of clubfoot in this part of Borneo Island. Understanding the barriers is essential for the success of treatment program implementation.

Materials and Methods

Research activities commenced once official clearance was given by the ethics committee of the institutions involved and the Ministry of Health. Written informed consent was obtained from all participants in this research. A questionnaire-based quantitative cross-sectional descriptive survey was conducted at a tertiary referral hospital in Sarawak, northwest of Borneo. The respondents were selected by simple random sampling. We adapted a set of a mixed closed-ended and open-ended structured questionnaires from the year 2006 study conducted by Kazibwe and Struthers entitled, "Barriers Experienced By Parents/Caregivers of Children With Clubfoot Deformity Attending Specific Clinics in Uganda" (19). Prior to redesigning the questionnaire, permission to adapt and translate the questionnaire was granted by the original authors.

The finalised questionnaire used in our study consisted of four main sections. Section A covered the socio-demographic variables such as the age of parents/caregivers and child, the gender of parents/caregivers and child, race, marital status, the level of education, employment status and monthly income. Section B referred to the level of knowledge and understanding of the parents/caregivers regarding clubfoot and its treatment. In Section C, a total of 11 questions were designed for the compliance to the treatment of clubfoot. Finally, Section D exemplified the factors or barriers that are affecting the treatment of clubfoot, as experienced by the parents/caregivers. The barriers that affect the treatment of clubfoot were further categorised into patient factor, family factor, doctor/healthcare personnel factor, socio-cultural factor, economic factor, geographical factor and logistics factor.

The questionnaire was produced in two languages, English and Malay. This was to enable participants to choose their preferred language. A pilot study was carried out to test the reliability and validity of the questionnaire and question guidelines. These questions were reviewed and refined in light of glitches that arose during the course of the pilot study. The revised questionnaire was re-tested with the same respondents as in the pilot study. The finalised questionnaire was used in the actual study.

The sample size calculation formula in this study was obtained from the formula for determination of sample size for estimating proportions (22).

The inclusion criteria for this study were (1) parents/caregivers of children with idiopathic clubfoot who have completed treatment regimen, (2) children with idiopathic clubfoot who previously defaulted from clubfoot treatment and clinic follow-up, (3) children with idiopathic clubfoot who were still having follow-up treatment at the time of the study, and, (4) any new idiopathic clubfoot case who came for treatment at the time of data collection. Defaulters are defined as those who missed three appointments or those who dropped out at any phase of treatment. Parents/caregivers of children with non-idiopathic clubfoot and other relatives who were not the principal caregivers of the patients were excluded from the study.

Data collection was conducted over a period of 6 months, from the end of May 2013 till November 2013. All quantitative data collected were analysed with Software Packages for Social Sciences (SPSS) version 21 for Windows (at the time of the study). Descriptive data from this study were analysed into frequency and percentage. Mean score and independent samples *t*-test were also used in the analysis of the data. The significance level was set at $p < 0.05$ or at the confidence interval of 95%.

Results

From the year 2005 to the year 2013, a total of 142 clubfoot patients were referred to the Orthopaedic Specialist Clinic, Sarawak General Hospital. A total of 105 patients were diagnosed to have idiopathic clubfoot which was defined as having a clubfoot without any other associated congenital anomalies. The remaining 37 out of 142 patients with other associated congenital anomalies were excluded from the study. Out of the total number of 105 idiopathic clubfoot patients, about 39.4% of the cases had bilateral feet involvement and about 57.7% of the cases were unilateral clubfoot. In the unilateral clubfoot cases, the left foot (32.4%) was more commonly affected than the right (29.5%). The male to female ratio was approximately 1:1. The Malays have the highest percentage of cases with 60 percent. This is followed by Chinese (18.1%), Bidayuhs (12.4%) and Ibans (9.5%). 45 out of the 105 patients were defaulter cases.

A total of 53 parents/caregivers participated in this study. In all cases, the recruited guardian was either a parent or close family member. The breakdown of recruits according to ethnic groups were Malays with 55% majority, followed by Chinese with 19%, Bidayuhs with 13%, other ethnic groups with 7% and Ibans with 6%. The majority of parents/caregivers fell in the range of 21 to 40 years old. Fifty-one percent of the respondents had an average educational level of high school degree. Most of the parents/caregivers were working either in the government or private sector or self-employed. Out of the 53 participants, 18 (34%) were housewives. The majority of the participants had a monthly household income of 1000 MYR or less.

The summarised data on the socio-demographic characteristics of the 53 participants who were enrolled in this study is shown in Table 1.

Table 1 : Socio-demographic characteristics of respondents (n = 53)

Socio-demographic Characterstics	n	%
Age Group (years)		
21-30	14	26
31-40	30	57
41-50	8	15
51-60	1	2
Gender (Parents/Caregivers)		
Male	13	25
Female	40	75
Race		
Malay	29	55
Chinese	10	19
Iban	3	6
Bidayuh	7	13
Others	4	7
Marital Status		
Married	50	94
Single	1	2
Widow/Widower	1	2
Others	1	2
Educational Level		
Did not finish primary school	3	6
Primary 6	3	6
Form 3	7	13
Form 5	27	51
Form 6/Certificate/Diploma	9	16
Degree	3	6
Masters	1	2
Job status		
Employed (government/private)	28	52
Self employed	3	6
Unemployed	1	2
Housewife	18	34
Pensioner	1	2
Student	1	2
Others	1	2
Total monthly gross income (Malaysian Ringgit, MYR)		
0-1000	16	30
1001-2000	9	17
2001-3000	9	17
3001-4000	8	15
4001-5000	3	6
5001-6000	3	6
6001-7000	2	4
7001-8000	2	4
8001-9000	1	1

From Table 2, in both defaulter and non-defaulter groups, there were two statistically significant factors/barriers to clubfoot treatment. The two factors were the geographical factor (distance travelled) and the logistics factor (transportation problem) with corresponding *p* values of 0.019 and 0.017.

The other factors mentioned in the study were poor cooperation from the child during the treatment of clubfoot (patient factor); $p = 0.868$, parents/caregivers having other commitments and responsibilities (family factor), $p = 0.164$; lack of knowledge and understanding regarding clubfoot and its treatment among parents/caregivers; lack of support from other family members (family factor), $p = 0.373$; lack of specialist in clubfoot (doctor/healthcare personnel factor), $p = 0.143$; lack of communication between doctor/healthcare personnel and parents/caregivers (doctor/healthcare personnel factor), $p = 0.455$; unclear explanation from doctor/healthcare personnel regarding clubfoot and its treatment (doctor/healthcare personnel factor), $p = 0.615$; socio-cultural factor, $p = 0.82$; and economic factor, $p = 0.226$.

The 5 highest mean barrier scores (*M*) among the defaulter group (n = 16) were geographical factor (*M* = 3.5), parents'/caregivers' other commitments and responsibilities (*M* = 3.13), economic factor (*M* = 3.125), logistic factor (*M* = 2.88) and parents'/caregivers' lack of knowledge and understanding regarding clubfoot and its treatment (*M* = 2.81). In the non-defaulter group (n = 37), the 5 highest mean barrier scores (*M*) were lack of specialist in clubfoot (*M* = 3.11), economic factor (*M* = 2.59), parents'/caregivers' other commitments and responsibilities (*M* = 2.57), geographical factor (*M* = 2.49) and parents'/caregivers' lack of knowledge and understanding regarding clubfoot and its treatment (*M* = 2.32).

Table 2: The relationship between barriers affecting the treatment of clubfoot among defaulter (n = 16) and non-defaulter (n = 37) groups.

Barriers to clubfoot treatment					
Barriers	**Group**	**n**	**M**	**SD**	***p*-value**
Patient Factor					
Uncooperative child	Defaulter	16	2.2	0.941	0.868
	Non-defaulter	37	2.14	1.378	
Family Factor					
Other commitments and responsibilities	Defaulter	16	3.13	1.258	0.164
	Non-defaulter	37	2.57	1.345	
Lack of knowledge and understanding	Defaulter	16	2.81	1.167	0.066
	Non-defaulter	37	2.32	1.286	
Lack of support from other family members	Defaulter	16	1.56	1.209	0.373
	Non-defaulter	37	1.3	0.878	
Socio-cultural Factor					
Cultural beliefs	Defaulter	16	1.73	1.163	0.82
	Non-defaulter	37	1.65	1.23	
Economic Factor					
Financial problem	Defaulter	16	3.125	1.455	0.226
	Non-defaulter	37	2.59	1.443	
Doctor/Healthcare Personnel Factor					
Lack of clubfoot specialist	Defaulter	16	2.44	1.21	0.143
	Non-defaulter	37	3.11	1.617	
Lack of communication	Defaulter	16	1.25	0.683	0.455
	Non-defaulter	37	1.49	1.17	
No clear explanation from health staff	Defaulter	16	1.625	1.025	0.615
	Non-defaulter	37	1.46	1.12	
Geographical Factor					
Distance to treatment is far	Defaulter	16	3.5	1.414	0.019
	Non-defaulter	37	2.49	1.387	
Logistic Factor					
Transportation problem	Defaulter	16	2.88	1.544	0.017
	Non-defaulter	37	1.84	1.344	

Discussion

The situation in Sarawak is comparable to the barriers to clubfoot treatment studied by the aforementioned authors (12,16-20). In this study, we have identified two significant difficulties in adhering to clubfoot treatment regimen in Sarawak.

The first significant contributing factor to clubfoot treatment adherence was the challenging geography of Sarawak. Sarawak is known for its vast geographical terrain. Some patients need to travel a great distance on dangerous unpaved muddy logging roads, from remote areas that are not easily accessible, by water or by air to hospitals. This makes the geographical factor the most compelling hindrance in seeking treatment. A similar scenario has also been described in Uganda and Malawi. These studies revealed that the parents/caregivers have no other alternative but to travel far for treatment (12,19,23). The long and treacherous journey to the treatment centre has invariably contributed to the number of defaulters.

Secondly, the transportation problem or logistics obstacle also emerged as significant impediment to seeking treatment, in our study. The combination of physical distance, transportation and financial problems is a major deterrent to the clubfoot treatment. In this study, parents/ caregivers stated that they did not have transportation to come for treatment. Some had to travel by using public transportation, which was costly and inconvenient. Various studies done in Latin America and Malawi also acknowledged that transportation problem was a major reason for the parents'/ caregivers' poor attendance (7,16,17,23).

In some of the cases encountered during the period of study, the extremely long travelling distance to our center and erratic transportation system necessitated admission throughout the initial phase of casting. Accelerated biweekly casting was employed in these cases to shorten the duration of hospital stay. The outcome of correction with the accelerated Ponseti protocol was found to be comparable with the conventional weekly Ponseti serial casting, with the additional benefit of shorter duration of treatment in other studies. In these studies, no significant difference in relapse rate was found (24,25). Apart from that, the more frequent correction and change of cast will allow more effective pressure ulcer detection and prevention (25). Keeping the cast from being soiled and dirty for one week can be challenging for some parents. Soiled and broken casts will be likely to cause loss of position. Hence, frequent change of cast in the accelerated Ponseti method might be the solution to this problem (24).

Uncooperative children during treatment can be challenging. The majority of the respondents in our study stated that their children have unsatisfactory compliance to clubfoot treatment, especially during casting and bracing. Treatment can be effortful as the distressed child will struggle and resist the physician's manipulations during casting (20). Considering this difficulty, the importance of high cooperation and understanding from parents/ caregivers is crucial in ensuring the success of treatment. A more child-friendly environment will help alleviate anxiety and emotional trauma during treatment.

Parents'/caregivers' other commitments and responsibilities are important factors affecting clubfoot treatment. Although it is not statistically significant, most of the respondents mentioned that they were unable to bring their children for treatment frequently as they have many other commitments and responsibilities. Leaving other family dependents behind and missing days at work while attending treatment is disruptive to the household and workplace daily routines. This has a negative impact on the compliance with the treatment protocol. As a consequence, the children fail to receive timely and adequate treatment. Our findings echoed comparable studies done in China and Latin America. In both areas, commitments and responsibilities that the parents/ caregivers were shouldering was one of the biggest hurdles to obtaining treatment for clubfoot (19,23). This aspect has tremendous influence on the parental compliance to the treatment of clubfoot (23) that might lead to poor adherence to the treatment protocol (12).

Existing studies have reported a knowledge gap as one of the contributing factors for poor compliance to treatment and the resulting improper treatment received by the children (19,20). This is also reflected in our study setting as the parents/caregivers agreed that they have very limited comprehension regarding clubfoot and its treatment. Fortunately, the study found no significant association between parents'/caregivers' knowledge about clubfoot and its treatment and their compliance to treatment. Despite this, the importance of knowledge and understanding regarding clubfoot should not be sidelined. Imparting knowledge to families of clubfoot patients is reinforced visually with videos of the cast application process and distributing brochures on clubfoot in the four main languages - English, Malay, Mandarin and Iban. This is done as part of our early consultation to the families involved. Throughout the duration of treatment, families are repeatedly reminded on the importance of treatment. Public education through health talks are organised at regular intervals as part of our outreach programmes to create awareness on clubfoot and the availability of treatment services locally.

Unsupportive family members is one of the factors identified in this study. Other studies showed that familial resistance and lack of paternal support are factors that act as barriers against clubfoot treatment (12,17). Parents have no choice but to give in to the elders in the family who disapprove treatment (17). Family support serves as a major role in determining the level of compliance to treatment (19). Although family resistance is not a major impediment to treatment in this study, positive backing from family members is essential to further enhance treatment compliance.

Specialists in clubfoot is still lacking in Sarawak. The possible reason could be due to there being very limited opportunity to pursue subspecialty training (23). As a result of this, health professionals who are trained to perform the Ponseti technique are only available in tertiary referral hospitals in Sarawak. The Ponseti method requires proper coaching. Physicians are forced to fork out their own funds and take time off work to attend workshops. Some doctors might have the skills but see an inadequate number of patients to perform the procedure (23). In China, physician education is often hampered by financial constraints (20). In Uganda, medical schools and various local and international government agencies have collaborated to establish the Uganda Sustainable Clubfoot Care Project (USCCP). USCCP aimed to standardize clubfoot treatment by implementing the Ponseti method of clubfoot treatment in the Ugandan healthcare system. USCCP pushed for awareness on clubfoot treatment at the grassroots level. As a result, the Ponseti method was included in the health care curricula of all higher education schools in Uganda, with particular emphasis on the detection, early referral and the treatment technique of clubfeet (11). Thus, emulating a more formal strategic approach such as the USCCP, implementation of the Ponseti serial casting method in the syllabus of medical schools, as well as in all allied health colleges, and the percutaneous tenotomy technique as a requirement in postgraduate orthopaedic training in our country, should be considered in view of the USCCP success.

Realizing the importance of making clubfoot treatment more accessible to patients living in the interior of Sarawak, annual training and refresher courses on the Ponseti method have been organised locally. Education materials with emphasis on the importance of detection and early referral for clubfoot deformity are distributed during the trainings. With more trained health workers on the Ponseti technique, the treatment services of clubfoot can be decentralised and disseminated to district hospitals and rural community clinics throughout Sarawak. Trained staff in the smaller centres will be able to offer and initiate Ponseti casting. This negates the need for weekly long-distance travel to tertiary centres for treatment. Decentralising and disseminating Ponseti treatment services to the smaller hospitals and clinics throughout Sarawak will improve treatment compliance in the long run. Uganda and Bangladesh went to the extent of establishing clinics dedicated for clubfoot care in rural areas. This strategy has gained success in overcoming treatment barriers (11,26).

Good communication skills are useful to provide better explanation regarding clubfoot and its treatment. Ineffective communication can mislead parents/caregivers to make inacurate interpretation of the treatment protocol. Communication breakdown could be due to language barriers (23). With good communication skills, better rapport and trust can be fostered between doctors/ healthcare personnel and parents/caregivers. This will help to promote compliance to treatment (28). On the contrary, lack of communication is not an issue addressed by the majority of the respondents in our study. The majority of the respondents mentioned that the doctor/ healthcare personnel have provided excellent services and that the doctors/healthcare personnel-parents/caregivers relationship was satisfactory.

Proper explanation is paramount to establish a better understanding on clubfoot and its treatment. This will give rise to improvement in the level of compliance to treatment protocol. Throughout this study, the majority of the parents/caregivers have specified that the doctors/healthcare personnel have given good and clear explanation regarding clubfoot and its treatment.

Culture and beliefs still have a considerable impact on the daily lives of the people in Sarawak. Although the responses indicated that ancestral beliefs play an important role in affecting clubfoot treatment, it was not statistically significant. Sarawak is known for its diverse ethnicity, cultural beliefs and traditional practices. These influence the way people think and perceive things. From this study, some of the respondents have a common notion that clubfoot is a consequence of the parents' wrongdoings during the antenatal period. As a result, parents/caregivers were blamed for causing the child to develop clubfoot. Several parents/caregivers declined serial casting as they have deeply ingrained conviction that traditional massage is sufficient to correct clubfoot. In Uganda and Malawi, the local people accepted that deformities are a result of supernatural power on the foetus *in utero* (16,17,23). Clubfoot deformity is stigmatized in some communities. In China, having children with clubfoot is an embarassment to the whole family. The child with clubfoot will be kept away from the public eye to conceal their family's "defective genes". Parents/caregivers will even shy away from western treatment and opt for traditional practitioners instead (20).

Financial burden was one of the restrictions that recruits faced when seeking for treatment especially during the weekly serial casting and bracing phase. According to the statistics from the 2015 Ministry of Human Resources, the Poverty Line for Sarawak is defined as poor for those with monthly household income of below 990 Malaysian Ringgit (MYR), whereas a monthly household wage below 660 MYR is considered as hardcore poor (29). The total gross household income per month of participants in this study mostly fell within the range of 0 to 1000 MYR, which is under the poor and hardcore poor group. This reflects the financial strain that the parents/caregivers encounter during the treatment process. During the serial casting period, the parents/caregivers have to travel weekly for change of cast. The hidden expenses incurred during the weekly visit is very high considering their income level. This is further aggravated by the fact that braces are very expensive. Not all parents/caregivers can afford to purchase braces. Moreover, as the child grows, they will need to change the splints and abduction braces. In most studies done in every part of the world, the economic barrier is also one of the most influencing factors identified.

This is a common problem, especially in developing countries. (16,17,20,23). To ameliorate the economic burden of the families involved, our government, through the Social Welfare Department, has provided financial aid for transportation and in special cases, the purchase of commercial abduction braces to needy patients.

In Sarawak, the costly commercial foot abduction braces in the market limits its usage to the priviledged higher income group of patients. Most lower income patients cannot afford to purchase the braces. The overwhelming appeal for government funding at times has caused restriction in timely acquisition of braces. As a temporary measure while waiting for the foot abduction brace, we resort to modify thermoplastic ankle foot orthoses with wooden bar. We are actively seeking cheaper alternatives to the existing modern foot abduction braces. The joint research collaboration with the Engineering Faculty of Universiti Malaysia Sarawak (UNIMAS) has yielded a hopeful prototype of a new improved brace that is versatile and affordable (30).

Strong alliance between the Health Ministry, higher learning institutions and non-profit organizations to form a sustainable national clubfoot program has attributed to the successful effective clubfoot care in several countries such as Bangladesh, Malawi and Uganda (7,11,26). At present, there is no such national program of that scale in our country. Lessons learned from these projects have taught us that problems pertaining to clubfoot treatment must be targetted from different angles. Launching of a national clubfoot program in our country will consolidate efforts in terms of standardizing health worker education syllabus and training, setting up of specialised clubfoot clinics in rural areas, coordinating public awareness activities, funding of casting materials and affordable braces to clinics as well as provision of financial aid to offset transportation and accommodation costs for lower income families.

Conclusion and Recommendations

Barriers to the clubfoot treatment that influence the compliance to treatment identified in this study are uncoorperative patients during treatment (casting and splinting), parents/caregivers having other commitments and responsibilities, unsupportive family members, lack of understanding regarding clubfoot and its treatment, inadequate specialists in clubfoot, traditional socio-cultural beliefs and practice, economic constraints, challenging geographical circumscriptions in Borneo and logistics limitations.

Clubfoot deformity has good prognosis if treated appropriately and in a timely manner, with strong support and involvement from committed parents/caregivers. Good acceptance and active involvement from parents/caregivers can be achieved if there is better understanding of the obstacles to treatment.

Concerted efforts to minimize the impact of barriers to clubfoot treatment should be carried out in order to reduce the risk of defaulting treatment. Although we may not be able to solve problems such as poverty, we should be aware of the existence of these obstacles to treatment. Enhanced understanding in this matter will guide us in devising culturally admissible ways to increase awareness to parents/caregivers regarding clubfoot and its treatment.

A sustainable national clubfoot programme will be very beneficial in providing a holistic approach to tackle barriers to treatment in our country in terms of implementing the Ponseti method in health worker education syllabus, organizing regular refresher courses for health staff, decentralizing clubfoot clinics to rural areas, coordinating public awareness activities, funding of casting materials and braces to clinics as well as providing financial aid to needy patients. More aggressive methods of accelerated casting should be reserved as the last resort to ensure compliance. There is also a need to intensify efforts in designing a more affordable abduction brace.

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