



Cost Analysis and Policy Implication of Physiotherapy Management of Cerebral Palsy in Nigeria

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Abstract

Cerebral palsy (CP) is a disorder of posture and movement, resulting from a permanent, non-progressive lesion to the immature or developing brain. There is uncertainty on the average cost of physiotherapy management of CP, beside the relationship between the costs of physiotherapy management of CP and health-related quality of life is also not well known. This study was conducted to determine the average cost of physiotherapy management of CP. A descriptive cross-sectional survey was carried out among 120 CP patients at the selected tertiary health facilities in Kwara and Oyo States, Nigeria. The age of the participants ranged from 2 to 8 years with a mean age of 4.10 ± 1.70 . The out-patient physiotherapy treatment charge per session at each of the health facilities was between ₦300.00 to ₦800.00. The costs of various associative devices were not less than ₦10,000:00 other indirect costs were between ₦24,000:00 and ₦48,000:00 with man-hour loss of ₦30,201 to ₦60,400:00. The mean annual physiotherapy management cost of children with CP was $₦55,693 \pm ₦24,415$. Significant difference between cost and health related quality of life among CP was established. It was concluded that the cost of physiotherapy management of CP was beyond what the care givers could afford, and therefore policy for funding support and subsidised physiotherapy treatment charges for participants was recommended.

Keywords: *Cerebral Palsy; Cost Policy; Physiotherapy.*

Introduction

Cerebral palsy (CP) is a disorder of posture and movement, resulting from a permanent, non-progressive lesion to the immature or developing brain. It is otherwise called static encephalopathy or Little's disease (Ogunlesi, 2008). A child with CP usually presents with relative degree of impairments depending on the severity. Impairment is any loss or abnormality of physiological or anatomical structure. This can later result to

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disability and ultimately, handicap (Omole, 2012). Study in South west Nigeria revealed 50.3% prevalent rate being the most common among the childhood neurologic cases with spastic quadriplegic type as the most rampant (41.9%) (Azubuike, 2007). Cerebral palsy is a major cause of disability in childhood and it causes environmental burden on parents psychological, socially and financially. Physiotherapy management is a major mainstay and long-term intervention for affected children (Rosenberg, 2007). Adelugba (2011) reported that cerebral palsy patients must be on continuous physiotherapy management to be able to improve on their developmental milestone for as long as needed. Caregivers such as parents or guardians are likely to spend substantial amount of their earnings which might deter some parents from continuous treatment of a child with CP. There is however, uncertainty on the average annual cost of physiotherapy management of CP among affected children in Nigeria. There is, therefore, need to critically appraise the cost implication of this intervention towards providing a genuine estimate that the parents of the affected children as well as governmental and non- governmental organisations who want to provide financial assistance can prepare their budgets. The need to know the cost of the interventions based on the level of severity of affectation in the affected children and access the eventual outcome of the affected children is very important. Finally, the magnitude and breakdown of costs incurred by a child with cerebral palsy would be relevant for planning health policy as well as broaden the focus towards preventing a case of cerebral palsy. This study was conducted with the overall goal of determining the average annual cost of physiotherapy management of cerebral palsy and to specifically estimate the annual physiotherapy cost of cerebral palsy management on an affected case.

Methods

The study was a descriptive cross-sectional survey at the selected tertiary health facilities in University of Ilorin Teaching Hospital (UIITH) Ilorin, Kwara State, Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan and Ladoke Akintola University of Technology Teaching Hospital (LAUTECH), Ogbomoso, Oyo State. The qualitative data were collected using a standard questionnaire. A sample size of 120 was determined using Fisher's formula for estimating sample size to determine the prevalence of proportion of a factor where the population is less than 10,000. One hundred and twenty children with CP who attended modern health facility and whose parents gave informed consent were randomly selected for the study (Fischer, 1998).

Ten percent (10%) of the sample size (120) was pretested at the Physiotherapy Department, Sobi Specialist Hospital, Ilorin, Kwara State which has the same characteristics with the tertiary health facilities selected in order to assess the reliability of the questionnaire. The questionnaire was re-arranged as appropriate items were put under the right domain without adding or removing any before it was applied to the selected respondents. The patients were recruited from physiotherapy clinics of the three health facilities in UIITH, Ilorin, as well as two neighbouring health facilities offering similar care for children with cerebral palsy - Adeoyo Maternity Teaching Hospital, Yemetu, Ibadan and LAUTECH, Ogbomoso, Oyo State, Nigeria.

Simple random sampling was used to select Kwara and Oyo States in North Central and South-West Nigeria respectively. Proportionate allocation of sample size was used to determine the number of respondents based on their population in each of the health facilities. Given that, if the sampling frame (p) for the three health facilities: $x + y + z = p$, then, participants in $x = x/p * \text{sample size}$. This was done for each of the health facility, where the sampling frame 'p' is the total lists of CP children aged 2-8 years in the three health facilities. Purposive sampling technique was used to select the out-patients' physiotherapy clinics where participants were recruited (Araoye, 2004). Ethical approval was sought and obtained from University of Ilorin/University of Ilorin Teaching Hospital Health Research Ethics Committee before the study commenced. The participant's consent was sought and the nature of the study was thoroughly made clear. The study was at no cost to the respondents and all information obtained was made confidential.

Data analysis

The data were analysed using SPSS version 19.0. Descriptive statistics of frequency, percentages, mean and standard deviation was used to summarise the data collected. T-test was used to test for the significant difference between intervention and health-related quality of life, as well as between parents/guidance educational status and quality of life of children with cerebral palsy. Analysis of variance was used to analyse the significant difference between cost and health-related quality of life of the participants and level of significance was set at 0.05.

Results

One hundred and twenty parents of children with cerebral palsy made up of 71 (59%) males and 49 (41%) females. The age of the participants ranged from 2 to 8 years with a mean age of 4.10 ± 1.7 . About 78 (65%) of the participants were between 2 years to 4 years, 30 (25%) were between 5 to 6 years while the remaining 12 (10%) were not more than eight 8 years of age (Table 1). The out-patient physiotherapy treatment cost at each of the health facilities differ. While ₦800.00 was charged per session at the University College Hospital, the other two hospitals charged ₦300.00 per treatment session. Majority of the participants were seen twice in a month in all the hospitals, except at the Out-patient Physiotherapy Department of Ladoko Akintola University of Technology where participants were seen between four to eight times within a month. Thus, some patients paid as much as ₦20,000.00 to ₦38,400.00 at both University of Ilorin Teaching Hospital and Ladoko Akintola University of Technology Teaching Hospital (Table 2). One of the CP patients reported having extra private physiotherapy treatment session with an annual cost of ₦120,000.00. The outcome of the study showed that majority of the participants bought various supportive devices worth ₦10,000.00 while just a few spent more than ₦10,000.00. 113 (94%) of the participants spent up to \leq ₦24000.00 as transportation fare to reach the health facilities annually while the remaining 7 (6%) spent between ₦25,000.00 and ₦48,000.00.

The participants' daily earnings were considered man-hour loss on each visit throughout the year based on participants' income. The result of this study therefore showed that about 88 (73%) had \leq ₦30,000.00 as man- hour loss while the remaining 32 (27%) had between ₦30,000.00 and ₦60,400.00 (Table 3). The average annual

physiotherapy treatment cost was a product of both the direct (actual) fees charged by the physiotherapy departments of the three selected tertiary hospitals, cost of procuring assistive devices and private physiotherapy visits as well as other indirect costs related to physiotherapy treatment in a year. This indirect expenditure ranged from transportation fare to man-hour loss and others. 50.8% of the participants spent less than or equal to ₦50,000.00, 54 (45%) spent between ₦50,001.00 and ₦100,000.00, 4 (3.3%) spent between ₦100,001.00 and ₦150,000.00 while only 1(0.8%) individual spent between ₦150,000.00 and ₦200,000.00 annually (Figure 1). Therefore, the mean annual physiotherapy management cost of children with cerebral palsy was ₦55,693.00±₦24,415.00.

ANOVA was used to analyse the significant difference between cost and health-related quality of life of the participants. The results of the analysis shown in Table 4 reveal a p value of 0.021. Since $p < 0.05$, this indicates that there is a significant difference between the cost and health-related quality of life among children with cerebral palsy.

Table 1: Sociodemographic characteristic of patients

Variables	Frequency	Percentage
Age of patients (years)		
≥2	78	65.0
5-6	30	25.0
≤8	12	10.0
Gender of patients		
Male	71	59.0
Female	49	41.0
Parent occupation		
Civil Servants	47	39.0
Traders	36	30.0
Students	4	3.0
Unemployed	8	7.0
Others	25	21.0
Parent monthly income		
Nil	8	6.7
₦10,000 – ₦50,000	72	60
₦51,000 – ₦100,000	25	20.8
₦100,001 – ₦150,000	12	10
₦150,001 – ₦200,000	3	2.5

Table 2: *Out-patient physiotherapy treatment charges*

Amount in Naira (×1000)	Participants in each hospital			
	ADEOYO	LAUTECH	UITH	TOTAL (%)
1- 19	33	34	45	112 (93.3)
20-39	0	4	4	8 (6.7)
TOTAL	33	38	49	120 (100)

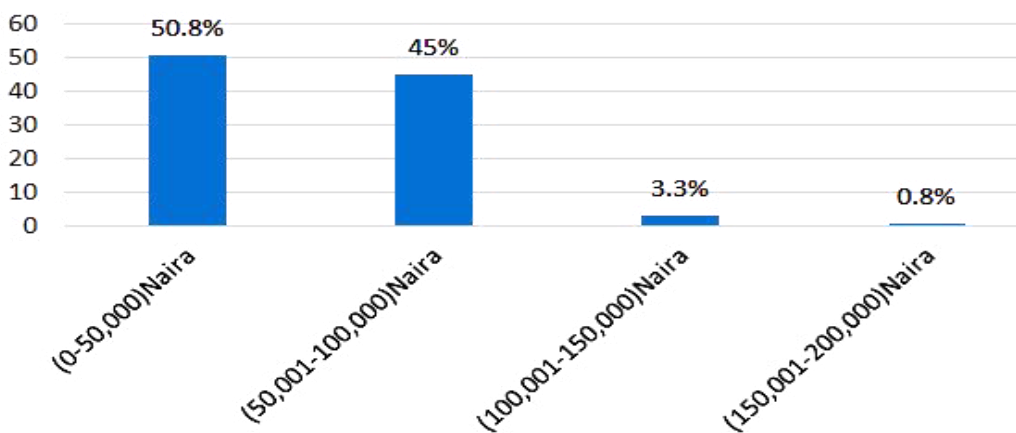
Table 3: *Man-hour loss quantified in terms of monetary loss*

Amount in Naira (×1000)	Participants in each hospital			
	ADEOYO	LAUTECH	UITH	TOTAL (%)
1- 30	31	26	31	88 (73.3)
31-60	7	7	18	32 (26.7)
TOTAL	38	33	49	120 (100.0)

Table 4: *Association between cost and health-related quality of life of the children*

Source	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1621.069	3	540.356	3.355	0.021
Within Groups	18682.329	116	161.055		
Total	20303.398	119			

$p < 0.05$

**Figure 1:** *Annual cost of physiotherapy intervention of cerebral palsy management*

Discussion

Despite the high cost of physiotherapy charges at the out-patient physiotherapy, the tertiary health facilities in the study recorded more patients than the two centres despite the lower cost of treatment. This is not surprising as clients prefer to access health care from facilities with more equipment and capacity to deliver. This has been alluded to by a previous study conducted by Jimoh (2014). The economic implication of providing care for children with cerebral palsy cannot be over-emphasised as the outcome of this study showed that most parents of these children spent between 2 to 4 hours at the physiotherapy clinics each day they visited for their children's treatment. As a result, they returned to work late as many of them were civil servants, traders and artisans. This is correlated with the findings of Lawal *et al.* (2014), who reported that about 28.3% of parents especially mothers of children with neurological disorders including cerebral palsy had to stop work. Emerson (2003) discovered that parents' time was grossly affected as 65.8% did spend between 1 and 5 hours per day to meet the needs of these children.

The average annual physiotherapy treatment cost was a product of both the direct (actual) fees charged by the physiotherapy departments of the three selected tertiary hospitals as well as other indirect costs related to physiotherapy treatment in a year. This indirect expenditure ranged from transportation fare, man-hour loss to other non-medical costs. Most studies carried out on cerebral palsy in Nigeria did not focus attention on the association between physiotherapy cost and health-related quality of life of the affected children. However, in a study conducted by Lawal *et al.* (2014) in the North- Western Nigeria on the socio-economic challenges of parents of children with neurological disorders revealed that 48.9% of the participants spent between ₦1,000.00 to ₦20,000.00 monthly as medical expenses. Therefore, annual medical expenses on all neurological cases seen in the study would approximately amount to less than or equal to ₦240,000.00. This study revealed average annual physiotherapy cost of cerebral palsy management as ₦55,693±~~₦~~24,415. This is comparable to a previous study which shows that the cost of the outcome of the cost of managing cerebral palsy alone would amount to ₦60,000.00.

The result of this study showed that 54% of the children's level of motor functions improved while 46% had no improvement in their motor functions despite physiotherapy intervention. This was closely related to the work of Ezema (2004), which indicated that 50% of the participants reported improvement in their motor function status post intervention. This is contrary to a study conducted by Kristi *et al.* (2014), which compared the influence of functional level, ambulatory and physical activity performance on self-reported health status and quality of life of youth with cerebral palsy.

Conclusion

Based on the outcome of this study, it can be concluded that health-related quality of life of the participants was dependent on the cost and health-related quality of life of the children with CP was dependent on physiotherapy interventions the cost of treatment that parents could not afford the cost of managing cerebral palsy as about 67% had monthly income of less than ₦50,000.00 while they paid an average of ₦55,693.00

annually to cater for just physiotherapy intervention. Also, physiotherapy intervention improves quality of life of children with cerebral palsy particularly those who are engaged early enough. It was, therefore, recommended that there should be policy on subsidised physiotherapy treatment charges for CP patients, provision of support for families in terms of funding and affordable there should be disable-friendly environment to support the disabled and caregivers.

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