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Assessing disparities in demand and health care expenditures burden in Nigeria: A comparison between people with physical disability and counterparts with no disability

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Abstract

Background: People with disabilities often have a diverse range of health needs. In addition to needed treatment and rehabilitation for their specific impairment, they often have higher risks of developing secondary conditions (e.g. depression) and comorbidities such as high blood pressure compared to individuals without disabilities. Consequently, they require more healthcare with a resultant high healthcare expense, which places additional demands on their household budgets. Given that individuals with disabilities are also more likely to be living in poverty, these expenditures pose a significant burden, impoverishment, and affect their health seeking behaviour. This study estimates healthcare expenditures and the burden associated with a physical disability in comparison with people without disability in a North-western, Nigeria.

Methods: A prospective cross-sectional study was conducted on 426 people with physical disabilities and sex and age-matched counterparts without disability, recruited using a multistage sampling method. The study collected household and individual information using a structured questionnaire. Data were analyzed using independent samples T-test and OLS log-normal model to examine differences in health-related expenditures, total out-of-pocket spending (OOP) and burden across disability status. The differences were adjusted for factors including demographics and socioeconomic factors, health and access to healthcare.

Findings: Between the study periods, people with physical disabilities consistently had higher total health expenditures, OOP and burden compared to their counterparts without disabilities. In the post-harvest period, the median expenditures were estimated at NN9900 ($50) for people with physical disabilities and N5400 ($23) for those without disabilities. Multivariate analyses show that people with physical disabilities were consistently found to have higher expenditures, OOP and burden during the two periods. The expenditures, OOP and burden increased over time and did not change even after other factors were adjusted.

Conclusions: People with physical disabilities were consistently found to have significantly higher health-related expenditures and at the risk of catastrophic health expenditure compared to their counterparts without disability. Providing healthcare coverage can ease financial burden and improve healthcare seeking behaviour.

Keywords: Burden Disability, Health Expenditures, Out-of pocket, Nigeria

Introduction

The World Health Organization (WHO) reported that about 15% of the world's population are living with disability as a result of the global the increase in chronic health conditions and other factors, such as road traffic accidents, falls, violence, humanitarian emergencies including natural disasters and conflict, unhealthy diet and substance abuse (1). A growing body of studies have also established that people with disabilities are the poorest, most marginalized and most vulnerable segment of any population both in terms of deprivation and high risk of morbidity and mortality (2,3). As a group, they experience a high burden of diseases and vulnerability to comorbidities (4) often, the primary condition associated with a disability may continue to result in poor health and quality of life (5,6). Consequently, they require more health care than the general population together resultant additional medical expenses, which may lead to catastrophic health expenditures (CHE) (7,8). Given that individuals with disabilities are also more likely to be living in poverty, CHE poses a significant burden that is likely to cause hardships including food shortage, lack of adequate sanitation and safe drinking water, and unmet healthcare needs (9–11).

Health care situation for people with disabilities has been unexplored in Nigeria judging from the review of available literature. However, the situation is likely to be no different from that described above due to facts that people with disabilities in the country face marginalization and a plethora of barriers to services, essentially depriving them of the opportunities that would help develop their potentials leading to productive and contributing lives (12). Majority of health care is privately financed in the country with Out-of-pocket (OOP) expenditure consistently accounting for over 70% of the estimated $10 per capita expenditure on health from 2010-2015 (13). The disparity in payment for health services disproportionately affects the poorest and vulnerable individuals who cannot afford the out-of-pocket cost because of the absence of social security for vulnerable groups, regressive taxation, poor planning, and lack of coordination across the three tiers of government (14,15). At present, only about 5% of Nigerians have prepaid health care through social and voluntary private insurance (16). It is important to understand how people with disabilities fare in this kind of situation in terms of healthcare expenditures, OOP and how this burden is affecting them and their households. This is especially for those with physical disabilities who have survived medical conditions such as stroke, tuberculosis (TB), trauma, and other related conditions that in the acute stage could wipe out households of earnings and savings (17,18). To the best of our knowledge, no study has so far assessed the disparity in health-related expenditures between people with physical disabilities and counterparts without disabilities. The objective of this study is to compare OOP spending on health, healthcare expenditures, and burden for individuals with and without disabilities and their trends between periods of post-planting and post-harvest in a North-western State Nigeria. Assessing these periods is to capture the seasonal variation in diseases in Nigeria such as cholera, malaria, respiratory diseases and other diseases (19–21) as well

as the seasonal dynamics in earnings and economic insecurity of the households between post-planting and post-harvest periods (22,23). The hypotheses tested in this study are that people with disabilities compared to their counterparts without disabilities will, (i) have higher out of pocket spending on health, healthcare expenditure, and out of pocket burden, (ii) have a disproportionate increase in OOP spending on health, healthcare expenditure, and out of pocket burden during the post-harvest period compared to post-planting period.

Methods

Study Design and Participants

The design for this study is a longitudinal study where participants involved people with a physical disability and people without any form of disability. The population for people with physical disabilities in this study was identified based on two criteria. The first was individuals who have any form of physical disability based on visible impairments/abnormalities affecting their mobility that lasted at least 6 months. The second was the use of Washington Group Short Set (WGSS) of Questions on Disability (24). Individuals were recruited if they reported severe difficulties in domains of walking and self-care the WGSS. The population for people without a disability was identified as individuals without any form of disability and matched with people with a disability according to age and gender.

Sampling procedure

The participants were recruited using a multi-stage strategy starting at the state level where five districts were randomly selected to represent the 9 health districts in the state. Two local government areas were randomly selected from local government areas in each district. Each local government was stratified into enumeration areas (EA) based on the 2006 Population Census. A total of 24 EAs were selected based on probability proportional to size (PPS). It was calculated that a sample of approximately 25 eligible households from each of 24 EAs would be required to identify a representative sample of individuals with disabilities, assuming a disability prevalence of 5%, with a statistical power of 90%, a significance level of 95%, and an estimated design effect of 2.5. At the final sampling stage, approximately 25 households were randomly selected from each EA for a total sample of 600 households. A total of 213 disabled respondents, as well as an equal control group of 213 matched according to age, gender, and location, were included in the study.

Data Collection

Data collection instruments for this study included socioeconomic and living conditions questionnaire and illness record and healthcare-seeking acts questionnaire. Socioeconomic and living conditions questionnaire was adapted from studies conducted on living conditions of populations in Nigeria (25). The instrument was used to collect information on household and individual socioeconomic and demographic parameters. Socioeconomic status was assessed using assets, and expenditure. Demographic parameters include sex, age, marital status, level of education, and employment. The illness record and healthcare-seeking acts were a longitudinal record of the participants occurrence of illness episodes and resulting healthcare-seeking acts according to the type of services (26). Households and participants

notified a local teacher when a participant fell ill and the teacher helped to fill out an illness record. Data on the patient, the illness, and healthcare responses were recorded as well as all formal and informal costs of treatment and other direct costs of care (like transport, food, and accommodation), but indirect economic costs of illness were not assessed. The dependent variables for the study include total OOP spending on formal and informal services paid directly by the individual or the family. Healthcare expenditure is a measure of total spending on healthcare (formal setting) including costs of transport, accommodation and food summed across inpatient, emergency room, outpatient (e.g., clinic and office-based visits, rehabilitation), pharmacy, and other (e.g., laboratory services, x-ray services, and medical devices). The OOP burden is a measure of the burden of OOP spending on healthcare as the percent of total household expenditure. The study was conducted over 6 months beginning June 2016 covering post-planting months of relative shortage: June-July-August, and post-harvest months of relative plenty: September-October-November.

Data analysis

Descriptive statistics were used to summarize and compare the socioeconomic characteristics and healthcare-seeking pattern of the study population and are presented as means (standard deviations), or as numbers and percentages as appropriate. The significance level was set at 0.05. Differences in levels and trends in OOP spending, healthcare expenditures, and OOP burden across disability status were examined using linear regression models. The outcomes were transformed due to the highly skewed nature of the data into logarithmic terms using ln(outcome+1), following example from similar work (27). The log-normal model was used to examine the relationship between expenditures and other variables. The covariates are categorized into 2 groups, demographic and socioeconomic, and health and healthcare utilization. The variables are included in models 1 and 2, respectively. This study received ethical clearance from Jigawa State Ministry of Women and Social Welfare and the University of Putra, Malaysia ethical approval committee.

Results

Demographic and socioeconomic variables

The distribution of several factors brings out significant differences between the disabled and non-disabled in various demographic and socioeconomic variables but gender (Table 1). People with disabilities have a significantly higher proportion of unmarried (39%) at the time of the study and more people living in rural areas (73%) compared to non-disabled proportions of singles (27%) and rural dwelling participants (64%). Concerning other factors, the result shows that groups with disabilities have a significantly higher proportion of those with no formal education (42%) and those not literate (42%) against group of those without a disability. Employment/unemployment proportion among the study participants appears to be large, and a significantly higher proportion of people with disabilities (54.5%) are not employed compared to those without disabilities (42.0%). Socio-economic status (SES) was measured by analyzing the possessions of 26 different assets in the household. The result shows that 49% of those with disability belonged to

the poorest group compared to 36% of those without a disability. Income from various sources was calculated at household and was found to be significantly lower among disabled participants than non-disabled.

Table 1: Distribution of demographic and socioeconomic characteristics of the study respondents

	Disabled n (%)	**Non-disabled n (%)**	**P-value***
Sex			0.17
Male	111 (52)	111 (52)	
Female	102 (48)	102 (48)	
Marital status			
Single	83 (39)	58 (27)	0.00*
Married	177(61)	155(73)	
Age categories			
18-29	171 (41)	86 (40)	
30-39	148 (35)	77 (37)	0.11
40-49	62 (15)	33 (15)	
50>	40 (9)	17 (8)	
Location (%)			0.02*
Urban	58 (27)	77 (36)	
Rural	155 (73)	137 (64)	
Formal education (%)			
No formal education	77 (36)	58 (27)	
Primary education	70 (33)	60 (28)	0.02*
Secondary education	51 (24)	60 (28)	
Tertiary education	15 (7)	36 (17)	
Employment (%)			
Employed	124 (58)	177 (83)	0.01*
Unemployed	89 (42)	36 (17)	
SES			
Poorest	104 (49)	77 (36)	
Least poor	66 (31)	94 (44)	0.00*
Rich	43 (20)	38 (18)	
Income (NN)			
Less than 10,000	143 (67)	117 (55)	
More than 10,000	70 (23)	96 (45)	0.00*
Self-rated health (%)			
Good	53 (28)	89 (42)	
Moderate	75 (35)	70 (33)	0.00*
Poor	79 (37)	53 (25)	
Distance travelled			
Less than 4km	89 (42)	137 (64)	0.00*
More than 4km	124 (58)	77 (36)	
Healthcare (%)			
Public PHC	34 (16)	51 (24)	
Public Hospital	49 (23)	43 (20)	
Private clinic	15(7)	36 (17)	0.00*
OTP	45 (21)	38 (18)	
Traditional/home remedy	70 (33)	45 (21)	

*Significant at p≤0.05, NN- Nigerian Naira (local currency), PHC-Primary healthcare

The trend over time in the measures of expenditures across the study period by disability status

Table 2 shows the levels and changes over time in the measures of expenditures across the study period by disability status. At the post-harvest period, median total OOP spending was estimated at NN5346 ($27) for those without disabilities, and NN9900 ($50) for people with disabilities, and average healthcare expenditure were NN2178 ($11) and NN3654 ($18) for those without disabilities and people with disabilities respectively. The median burden of OOP on household expenditure was 4.8% for people without disabilities but 9.4% for people with disabilities. This provides the first support to the first hypothesis that people with disabilities have substantially higher total OOP spending, health expenditures, and OOP burden compared to those without disabilities. Over the study period, the gaps in mean and median expenditures across disability status remained stable. As shown in the ratio column, the median OOP spending for people with disabilities was 1.8 times higher than those without disabilities in the post-planting period but 2.0 times higher at post-harvest. Healthcare expenditure has increased for both groups between the two periods but increased more for people with disabilities. Median healthcare expenditure grew by 27% for people with disabilities and by 14% for those without disabilities. The median OOP burden has decreased by 33% from 8.8 to 5.9 for those with a disability and increased by 20% from 9.8 to 7.8 for those without disabilities. This result supports our second hypothesis that health expenditures have disproportionately increased for persons with disabilities.

Regression analysis of expenditure differences across the study period by disability status

The result of the unadjusted and models 1 and 2 that adjusted for demographic and socioeconomic factors, healthcare-seeking, and access to healthcare respectively is shown in table 3. The first column of the table presents the result of the three outcomes in an unadjusted model with only time, disability, and the interaction term of disability and time as independent variables. The estimated parameters of the time and disability variables are positive in models of OOP spending and healthcare expenditures, indicating that they have increased between the two periods and that there are significant differences in OOP spending and health expenditures across disability status. The estimated parameters of the model with OOP burden are negative indicating that burden decreased between the two periods and that there are significant differences in OOP burden over time across disability status. The coefficient of the disability time interaction term is positive and significantly different from zero in the regression of health expenditures and burden but imprecisely estimated for OOP. This suggests that healthcare expenditures and OOP burden may have disproportionately increased for persons with disabilities compared to those without a disability. In the second and third columns of Table 3, demographic and socioeconomic characteristics, and health and access to healthcare factors were controlled. After the introduction of health and access to healthcare, the regression coefficient of the disability binary variable is reduced but remains positive and significantly different from zero for health expenditures (from 1.721 to 0.938), OOP healthcare (from 1.121 to 0.682) and OOP

Table 2. Trends in OOP spending, healthcare expenditure, and OOP burden

	Mean			Median		
	Disabled	**Not Disabled**	**Ratio**	**Disabled**	**Not Disabled**	**Ratio**
Total OOP spending (NN)						
Post-planting	3561 ($18)	1940 ($10)	1.8*	5700($29)	3200($16)	1.8*
Post-harvest	5185 ($26)	2980 ($15)	1.7*	9900($50)	5400($27)	1.8*
Healthcare expenditure (NN)						
Post planting	2350 ($12)	1580($8)	1.5*	3200($16)	2150($11)	1.9*
Post-harvest	2870 ($15)	1940($10)	1.5*	3650($18)	2310($12)	2.0*
OOP burden						
Post-planting	8.8	4.1	2.1*	13.4	5.4	2.5*
Post-harvest	5.9	3.1	1.9*	9.4	4.8	1.9*

Significant at p≤0.05, NN-Nigerian Naira (local currency), 1$=198NN (Central Bank of Nigeria, 2016

burden (from 1.633 to 0.899). These results provide support to our first hypothesis that people with physical disabilities have higher total health expenditures, OOPs, and burden. In Models 1 and 2, the disability time interaction terms were insignificant for the three outcomes after the covariates are uncontrolled. This shows that disability is not associated with differences in the outcomes between the two periods.

Discussion

At each and the two study periods, people with disabilities had greater total OOP spending, healthcare expenditures, and OOP burden compared to their counterparts without a disability. At the post-harvest period, average healthcare expenditures were NN2310 ($11) and NN3650 ($18) for those without disabilities and people with disabilities respectively. The healthcare expenditure for people without disabilities is almost similar to estimates from the general population where the average total household health expenditure per month was N2354 ($12) (28). However, this disparity is even though people with disabilities used more traditional and home remedies and less private facility consultations. The higher healthcare expenditure among people with disabilities could be due to the higher utilization of hospital services, which has been documented to be high and a determinant of healthcare expenditure among people with disabilities (4,29,30). This has been attributed to the fact that people with disabilities are more likely to utilize hospital facilities due to a higher need for specialist services and emergency care. The high hospital healthcare-seeking pattern among people with disabilities can be

attributed to delay in receiving appropriate health care until conditions become poor or worsened leading to critical health conditions that require urgent care, ultimately generating higher medical costs (31). For example, the rate of hospitalization for people with disabilities was found to be particularly high at about five times that of people without disability in India (32).

Table 3: Unadjusted and Adjusted Trends in Total and Out-of-Pocket Expenditures and Burden by disability Status

	Unadjusted		Model 1		Model 2	
	Beta	**SE**	**Beta**	**SE**	**Beta**	**SE**
OOP spending						
Intercept	3.512	0.021*	1.888	0.027*	0.660	0.033*
Time	0.124	0.008*	0.263	0.005*	0.101	0.011*
Disabled	3.721	0.061*	1.721	0.023*	0.938	0.059*
Disabled* Time	0.143	0.018	0.012	0.009	0.003	0.000
Healthcare expenditure						
Intercept	1.031	0.026*	0.682	0.032*	0.046	0.030*
Time	0.097	0.009*	0.006	0.010*	0.64	0.042*
Disabled	0.416	0.058*	1.121	0.062*	0.682	0.029*
Disabled* Time	0.371	0.037*	0.001	0.004	0.001	0.000
OOP burden						
Intercept	1.031	0.021*	0.691	0.029*	0.991	0.072*
Time	0.026	0.019*	0.42	0.035*	0.033	0.012*
Disabled	0.411	0.580*	0.633	0.029*	0.899	0.036*
Disabled* Time	0.307	0.301*	0.001	0.000	0.002	0.001

The adjusted trend is based on ordinary least squares regression on logged out-of-pocket spending, healthcare expenditures for total and out of pocket burden. Model 1 adjusted for gender, age, marital status, location residence, education, employment, SES, and income. Model 2 additionally included controls for health status, healthcare utilization and access to healthcare. * $p < 0.05$

Another finding in Korea showed that people with disabilities had a twofold or more increase in the odds of using inpatient hospital services (33). The location of hospital facilities is also another factor that could add to the expenditure. Studies conducted showed extra charges were incurred in instances where an individual using a wheelchair was required to pay double the fare and also the fee of the caregiver, as the individual needed need assistance in going to the hospital (34,35). These expenses could place extra demands on household budgets, which in this study can rise to as high as 13.4% of total household expenses, can prevent or delay seeking health care or when care is sought results in significant financial consequences (1). The consequences of which may result when households took drastic decisions in financing urgent care, such as selling assets, taking out loans or reducing consumption of other necessary household items (36,37). These decisions, while often the only option, nonetheless depletes households of resources that could be used to invest in family enterprises, education and other productive avenues, which push households into further impoverishment, a consequence of catastrophic healthcare expenditure (38,39). Although this study did not estimate the extent to which health-related expenditures contributes to poverty among people with disabilities, there is cyclically re-enforcing relationship between disability and poverty where deprivations such as lack of

access to health care, water and sanitation and education, poor nutritional status and poor living conditions, increase the risk of disability (40,41). This situation has implications for researchers and policymakers to appreciate and highlights the need for innovative health financing policies based on economic principles with overall aim to reduce out of pocket and offers financial protection to improve health outcomes as well as social and economic benefits (42,43). This can be achieved in several health system financing options that include mix services across a range of promotion, prevention, treatment, and rehabilitation services (44,45). In advertently, financial protection is central to the achievement of universal health coverage (UHC) and the implementation of appropriate social protection systems as part of the Sustainable Development Goals (46).The concept of UHC has become central to the promotion of the belief that financial and risk pooling offers the best guarantee for protecting the most vulnerable including people with disabilities from financial hardship as well as providing cost-effective expenditure(47). The concept of universal health coverage is relatively new in the majority of African countries, including Nigeria (48–50). The objective of the health insurance policy in Nigeria seeks to provide financial risk protection and access to quality healthcare for vulnerable population populations including people with disabilities by creating adequate pooling of risk (51,52). Regrettably, evidence reveals that wide gaps still exist in achieving the objectives of the health insurance program in the country (51,53) and the disparity disproportionately affects the poorest and vulnerable individuals (14,15). This study has several limitations. It does not provide any direct evidence on the effects of the states' policy on healthcare or responsiveness to the plights of the people with disabilities. It is important to look into the situation to assess the specific impact of policy initiatives on OOP and generally on access to healthcare among people with disabilities. Another limitation is that this study does not cover other groups of people with disabilities (such as sensory or intellectual) and neither included an institutionalized population with disabilities and is therefore not representative of all populations with disabilities. Time and resource constraints prevented a larger sample size, which could have more rigorous results, especially on issues at hand.

At the macro-level, a structural change in the sharing of responsibilities for health care among the three tiers of government, which poses a serious challenge for significantly extending social insurance to uncovered groups, should be leveraged to accelerate the process by supporting the states to establish and manage their insurance funds while encouraging integration with the National Health Insurance Scheme (NHIS) (52,54). Specifically for people with disabilities, the WHO recommended a reform in health laws and policies by including people with disabilities in health financing and plans inconsistency with the principles of the Convention on the Rights of Persons with Disabilities (WHO, 2013). This includes involving and engaging people with disabilities who know best what their needs are in decision-making at all levels to improve their awareness and knowledge of the scheme and its benefits. Another recommendation is to target people with disabilities with social protection schemes including an exemption to enable them to access routine services and extend to

rehabilitation services. Consider non-medical costs by providing support to meet the costs associated with accessing health care, such as transport or consumables to lower costs associated with seeking health care services.

Conclusions

This study contributes to an important knowledge gap of equity in health expenditure and burden associated with healthcare-seeking across disability status. The study finds that substantial differences in health-related out of pocket spending, healthcare expenditures, and OOP burden are associated with disability. These differences after controlling for demographic, socio-economic, access and health status, in all three healthcare costs were found to continue to be disproportionately higher for individuals with a disability than their counterparts without a disability. Further research is needed on specific policy initiatives to reduce OOP and burden on persons with disabilities. This study has implications for researchers and policymakers by highlighting the need for innovative health financing policies based on economic principles that aim to reduce out of pocket and offers financial protection to improve health outcomes as well as social and economic benefits. This can be achieved in several health system financing options that include mix services across a range of promotion, prevention, treatment, and rehabilitation services. Another implication is that the government should involve and engage people with disabilities who know best their needs are in decision-making at all levels.

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